EDUCATIONAL MONEYBALL: PRINCIPALS' DECISION MAKING IN THE SCREENING AND SELECTION OF EFFECTIVE TEACHERS

by
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Abstract

The screening and selecting of teacher candidates is important to the success of all students and for school performance. There is a need for principal professional development on the human capital management skills that school leaders need in order to succeed in high-poverty, low-performing schools. With principals being held more accountable for the success of public schools and student achievement, it is important they ensure the most highly qualified and effective teachers are in every classroom. It is important for students in high-poverty schools with a high number of Black and Hispanic students and students on free and reduced meals to be taught by teachers who are knowledgeable, experienced, teaching within their subject field, and certified. Using education production theory, predictive analysis, and decision-making theory, this study examined the empirical research surrounding the effects of teacher credentials on student achievement, and provided an intervention in which principals would simulate the screening and selection process, identify the criteria they use, and reflect on their decision-making processes when screening and selecting teacher candidates. In turn, principals would make more knowledgeable and informed hiring decisions. Using a quasi-experimental preintervention–postintervention design, this study analyzed the credentials on which high school principals place the most importance when screening and selecting teacher candidates. Seventeen principals of high-poverty, low-performing high schools in a mid-Atlantic school district participated in an online professional development on the credentials that have been found to have positive effects on student achievement, and were trained on how to use the administrative decision-making model to make more informed screening and selection decisions in the future. Data from the study showed the principals relied on their gut instincts and experience despite participating in the professional development. The results of the study suggest

principals need training on hiring practices and how to make research-based decision-making strategies.

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Executive Summary

In 1966, *Equality of Educational Opportunity* (Coleman, 1966), better known as the *Coleman Report*, set out to identify the school effects that led to student achievement in American schools. Most importantly, Coleman (1966) attempted to find ways to improve the inequalities faced by students of color, those at high-poverty schools, and the factors that created those inequalities. Among the factors examined in the report were the quality of a student's school, the family background of students, and the quality of the credentials and characteristics of the teachers.

Over 50 years later, social scientists continue to examine the inputs that lead to student achievement. Notably, when examining teacher credentials, the quality of teachers and the factors that are believed to lead to their success are still tied to their level of degrees attained (Engel, 2013; Goldhaber & Brewer, 1996a; Peske & Haycock, 2006) and years of experience (Clotfelter, Ladd, & Vigdor, 2010; Glazerman & Bruch, 2011; Harris & Sass, 2009; Kersting, Chen, & Stigler, 2013; Rutledge, Harris, Thompson, & Ingle, 2008). The majority of the public school systems in the country base their teacher salary scales on the number of years a teacher has been in the classroom and whether the teacher has an advanced degree (master's degree or doctorate).

Other credentials that have been examined over the years to see if they have a positive effect on student achievement are level of certification (Clotfelter et al., 2010; Peske & Haycock, 2006), National Board certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007), and undergraduate institution attended (Ballou, 1996; Clotfelter, Ladd, Vigdor, & Wheeler, 2007; Ehrenberg & Brewer, 1994). Identifying the teacher credentials related to student achievement has become even more important as school accountability has increased and both teachers and

administrators are being evaluated on the success of their students. Research has shown the credentials that have a positive effect on student achievement are (a) a bachelor's degree from a highly competitive university (Clotfelter et al., 2010), (b) three to five years of teaching experience (Goldhaber, 2007; Harris & Sass, 2009; Kersting et al., 2013), (c) standard state certification (Clotfelter et al., 2007), and (d) National Board certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007; Harris & Sass, 2009).

For principals, it is important to know the credentials related to student achievement, and to have a plan on how to screen and select those teacher candidates who are going to have a positive impact on students. The decision-making processes principals use to hire teachers can no longer be based on instincts and gut feelings; they must be based on what the data show. An emphasis needs to be placed on making sure principals are trained properly in identifying those credentials, know how to make more informed hiring decisions, and are able to select the best candidates from a limited applicant pool.

Chapter I

Understanding the Problem of Practice

Poor hiring decisions can have long-term negative consequences for a school and its students (Papa & Baxter, 2008; Rinehart & Young, 1990; Rose, English, & Finney, 2014; Schumacher, Grisby, & Vesey, 2015). To raise student achievement, schools must provide effective teachers (Hallinger, Heck, & Murphy, 2014). Hallinger et al. (2014) defined *effective teachers* as those who have the skills to teach and motivate students of all backgrounds and skill levels. The problem with trying to create a single definition of *effective teachers* is that identification of those skills and credentials can differ from principal to principal, school to school, district to district, and state to state (Hanushek, 1981). Principals, parents, politicians, and teacher unions have been trying to determine how to identify effective teaching, how it is measured, and what credentials one must possess to be considered effective. The credentials of teacher candidates are especially important when hiring teachers for high-poverty schools. The No Child Left Behind Act of 2001 (NCLB, 2002) defined a *high-poverty school* as being

> Within the top quartile of elementary and secondary schools statewide, as ranked by the number of unfilled, available teachers, or is located in an area where at least 30 percent of students come from families living below the poverty line, or an area with a high percentage of out-of-field teachers, high teacher turnover rate, or a high percentage of teachers who are not certified or licensed.

It is hard for high-poverty schools to retain staff and attract new applicants due to their reputations for having low academic performance, unruly students, and low teacher morale (Clotfelter et al., 2007; Engel & Finch, 2015; Hanushek, Kain, & Rivkin, 2004; Ingersoll, 2001). Teacher turnover at high-poverty schools is 50% higher than at low-poverty schools (Ingersoll, 2001). Principals at high-poverty schools are finding it difficult to hire and retain effective teachers due to shallow applicant pools (Liu, Rosenstein, Swan, & Khalil, 2008). As a result,

students who attend high-poverty schools can be placed at a disadvantage in their efforts to be college- and career-ready. In some instances, students are being taught by teachers who do not have the knowledge and skills to properly present the curriculum, or they have teachers who may be burnt out and no longer motivated to teach (Clement, 2009; Simon & Johnson, 2015). Students at high-poverty schools, therefore, are not afforded the same quality of education as those in more affluent schools (Hanushek et al., 2004). The inequities in teacher effectiveness impact all students of low socioeconomic status and widens the achievement gap (Peske & Haycock, 2006). Studies by Lankford, Loeb, and Wyckoff (2002); Peske and Haycock (2006); and Clotfelter et al. (2010) of school systems in Cleveland, Chicago, Milwaukee, New York, and North Carolina attempted to identify the most valuable teacher credentials and the effects those credentials have on increasing student achievement.

Theoretical Framework

The Moneyball Theory

In his 2003 book, *Moneyball: The Art of Winning an Unfair Game*, Michael Lewis examined the Major League Baseball team the Oakland A's and the decision-making processes they used to select and sign players. The book highlighted the gap between large-market teams, with unlimited budgets (e.g., New York Yankees, Los Angeles Dodgers, Boston Red Sox) to attract and pay for the top players, and those teams (e.g., Oakland A's, Kansas City Royals, Pittsburgh Pirates) without the financial resources to attract and sign the top players to huge contracts. By being able to afford the top players, the large-market teams are able to place winning teams on the field, while the small teams struggle to be competitive. Opposing sides have developed over the years in how to scout and evaluate player talent. The traditional way of predicting a player's talent was based on qualities such as physical attributes and traditional

statistics (credentials) such as batting average, homeruns, and runs batted in. The new generation of scouts uses a system called *sabermetrics*, which analyzes the players' statistics and skills that are most associated with winning games (e.g., walks, on-base percentage, slugging percentage). The *Moneyball* theory looks into how small-market teams could find value in other credentials in order to place the best players on the field without having to spend all of their budgets, and to find those "diamonds in the rough" who would otherwise be overlooked by traditional standards.

This study incorporated the philosophy of the *Moneyball* theory to examine and analyze the traditional credentials that have been used to identify teacher effectiveness, tenure, and salary (years of experience, advanced degrees, and certifications). Do these credentials lead to student achievement? Have other credentials been undervalued or dismissed by principals when screening and selecting teacher candidates?

Education Production Function Theory

In the district being studied, there are no data that provide insight into whether teacher credentials have an effect on the achievement of their students. The researcher believes the key to determining the effectiveness of experienced teachers is identifying the teacher inputs (credentials) that lead to student achievement (outputs). The district has set forth a set of five milestones to determine whether students are achieving on the high school level: (a) a C or higher in English 9 and Algebra, (b) Grade 9 eligibility, (c) AP 3 or higher (Advanced Placement, scored on a 5-point scale from 1 = *no recommendation* to 5 = *extremely well qualified*; 3 = *qualified*)/IB 4 or higher (International Baccalaureate, scored on a 7-point scale from 1 = *very poor* to 7 = *excellent*; 4 = *satisfactory*), and (d) SAT 1650 or higher/ACT 24 or higher (MCPS, 2015c). Each of the milestones is tied to making sure all students are college- and career-ready. Teachers in this district have salaries based solely on how long they have been

teaching, their level of certification, and whether they have an advanced degree (master's degree or doctorate). Also, in the district, bonuses are given to those teachers who achieve National Board certification.

Education production function theory (also referred to as input–output analysis) examines the relationship among the different inputs, such as experience and degrees, and the outcomes of the educational process (Hanushek, 1986). According to Hanushek (1986), the outcomes of the educational process, the achievement of individual students, is directly related to a series of inputs. The inputs are the characteristics of the school, the teachers, and the curricula (Hanushek, 1986). These characteristics have the capacity to determine the achievement level of a student based on the school the student attends, the type of teacher the student has, and the curriculum being taught. A majority of the studies of educational production relationships measure output by standardized achievement test scores, although significant numbers of studies have employed other quantitative measures such as student grades, student attitudes, school attendance rates, and college continuation or dropout rates (Hanushek, 1986). These various measures of success would suggest individual schools, or school systems, may be inconsistent in determining what aspect of student achievement they want to measure. Requiring uniform mandates is problematic as different school districts and/or states would have different guidelines for determining teacher effectiveness. Other researchers have followed Hanushek in determining the best methods of determining the impact of teacher credentials on student achievement.

Lakdawalla (2006) stated it is necessary to measure the quality of teachers and other workers by identifying an index of skills that are valued throughout the labor force. To have a legitimate measure of teacher effectiveness, all stakeholders need to determine an output that provides a unified identification of student achievement. This measure would address the need

for teachers to provide the same assessments to their students, such as standardized tests, IB exams, or AP exams. While standardized tests create a starting point in measuring teacher effectiveness, many critics reject the education production theory because the educational outcomes cannot be adequately quantified (Hanushek, 1986).

According to Hanushek (1986) and Murnane and Steele (2007), there is no strong evidence that teacher education and experience have an expected positive effect on student achievement. Hanushek found the closest thing to a consistent, yet not very strong, finding among student achievement is that teachers who perform well on verbal ability tests do better in the classroom. Other requirements that are given high importance, such as advanced degrees, were found to be a waste of time, money, and resources.

According to Hanushek (1986), teachers should not be required to pursue graduate courses merely to meet tenure requirements or to get an additional salary increment. Murnane and Phillips (1981), Bonesronning (2004), Jacob (2007), and Murnane and Steele (2007) found that years of experience and level of education of a teacher do not play a role in teacher effectiveness. According to Hanushek and Rivkin (2010), school systems are currently paying teachers based on the wrong inputs. Examples of teacher individual characteristics that may or may not affect student achievement are college entrance exams, high school and university grade point averages (GPAs), professional teacher education achievements, and certification status (Piro & Mullen, 2013). With this research-based information, this study explored the credentials on which principals place the most value and what decision-making processes they use in the screening and selecting of teacher candidates.

Statement of the Problem

The school district examined in this study is located in a large mid-Atlantic district. The district is considered to be one of the most successful school systems in the United States (MCPS, 2011). The district consists of 25 high schools with an enrollment of 47,450 students. Eleven of these high schools are labeled as *high-poverty* due to their high number of students on free and reduced meals (FARMs; Bonner-Tompkins, 2014). Fourteen of these high schools are labeled as *low-poverty* due to the low number of students on FARMs (Bonner-Tompkins, 2014). The county is broken into "consortia and consortia like schools" (Bonner-Tompkins, 2014, p. i) and "non-consortia" (p. i) schools. The consortia and consortia like schools consist of the high-poverty schools, and the non-consortia schools consist of the low-poverty schools. According to the district's Office of Legislative Oversight (Bonner-Tompkins, 2014), when compared to their peers in low-poverty high schools, students in high-poverty high schools in the district are 9% less likely to graduate on time, 29% less likely to complete Algebra 2 by Grade 11 with a C or better, 45% less likely to earn at least one qualifying score of 3 or above on an AP exam, and 56% less likely to score 1,650 or above on the SAT or 24 or above on the ACT.

These achievement data indicate there is an achievement gap between students at high-poverty high schools and low-poverty high schools in the district. Clotfelter et al. (2007) suggested some of the causes of the achievement gap between schools can be attributed to the credentials of the teachers in high-poverty schools. Many teachers in high-poverty schools have little or no teaching experience, while others may be teaching out of their content area or may lack advanced degrees or certifications (Clotfelter et al., 2007). As a result, students at high-poverty high schools, like those mentioned in this district, are put at a disadvantage for not

having access to highly qualified teachers. Despite these disadvantages, administrators are still being held accountable and measured by the same standards as those at low-poverty schools.

Review of the Literature

This chapter includes a review of the literature relating to the problem of identifying effective teachers and the teacher credentials that have the most impact on student achievement. The goal of this study was to help present principals with a research-based process for screening and selecting effective teachers. Using predictive analysis and education–production function theory (Goldhaber & Brewer, 1996b; Hanushek, 1986; Hanushek & Rivkin, 2010), the intent of this study was to identify the teacher credentials that lead to positive student outcomes. The chapter also includes a discussion of predictive analysis and decision-making theory. To better understand the value of teacher credentials and their importance to the screening process, the following research questions (RQs) guided this study:

RQ1: What teacher credentials have a positive effect on student achievement?

RQ2: To what extent are the credentials of teachers at high-poverty high schools different from those at low-poverty high schools?

RQ3: What credentials do principals look for when screening and selecting effective teachers, and what is their decision-making process?

RQ4: To what degree are principals involved in the screening and selection process?

Identifying Teacher Quality

The seminal study mentioned in all contemporary research of teacher credentials is the *Coleman Report*. The report was in response to the Civil Rights Act of 1964. In the report, Coleman (1966) explored the differences in schools, resources, and teachers, between White and Black children. Coleman stated, “The quality of teachers shows a stronger relationship to pupil

achievement" (p. 22). Credentials examined as being related to student achievement were the teacher's score on a verbal skills test and the teacher's educational background (Coleman, 1966). The researchers concluded the qualities of the teacher have an impact on student achievement, and the teachers in schools that were predominantly Black and Hispanic lacked those qualities (Coleman, 1966). Coleman found that teachers who taught at schools with a high population of students of color were less prepared than teachers who taught at predominantly White schools. The *Coleman Report* marked a significant moment in education because it confirmed that, despite desegregation, public education was still unequal. Since the *Coleman Report*, efforts are still being made to make sure all schools have high-quality teachers.

The Elementary and Secondary Education Act

The Elementary and Secondary Education Act of 1965 (Title I) was amended by NCLB in 2002. Title I gives priority to schools in obvious need of funds, low-achieving schools, and schools that demonstrate a commitment to improving their education standards and test scores (Maryland State Department of Education, 2003). In Maryland, Title I funds are distributed to high-poverty schools within their districts so the schools can provide additional academic support, teachers, and learning opportunities to help low-achieving children (Maryland State Department of Education, 2003). As of the 2014–2015 school year, the school district in this study had 28 Title I schools.

Section 1119 of NCLB (2002) states each local education agency (LEA) in the United States "shall develop a plan to ensure that all teachers teaching in core academic subjects within the state are highly qualified no later than the end of the 2005–2006 school year." Each LEA will also include an annual increase in the percentage of teachers who are receiving high-quality professional development, to enable such teachers to become highly qualified and successful

classroom teachers; and may include such other measures the state education agency determines to be appropriate to increase teacher qualifications (NCLB, 2002).

Peske and Haycock (2006) contended Title I does not provide the assistance that high-poverty schools need. The researchers argued the money sent to high-poverty schools does not go toward hiring effective teachers (Peske & Haycock, 2006). The teachers with more experienced and advanced degrees who make more money have no incentive to go to the high-poverty schools; therefore, school districts are spending less money on Title I schools despite the additional funding (Peske & Haycock, 2006). With a disadvantage in hiring effective teachers, principals of high-poverty high schools need to be cognizant and strategic in their use of processes to screen and select teachers.

President George W. Bush's NCLB (2002) and President Obama's Race to the Top Act (2011) also attempted to identify the qualifications and credentials that make an effective teacher, but the criteria were still unclear. According to NCLB, a *highly qualified teacher* is defined as someone who (a) holds a bachelor's degree, (b) has full state certification, and (c) demonstrates subject-matter competency. With that said, it can still be difficult for stakeholders to evaluate whether a teacher is being effective, and how. The current system used by principals to evaluate teachers after they are hired, the classroom observation, can award a satisfactory evaluation to a teacher who goes above and beyond for his or her students and to a teacher who does the bare minimum (Jacob & Lefgren, 2008). The challenge is to find a way to predict, during the screening and selection process, whether a teacher will be effective.

High-Poverty Schools

NCLB (2002) created a national indicator of the characteristics of a high-poverty school. *High-poverty schools*, as defined by NCLB, are schools that are (a) located within urban or rural

areas in which more than 30% of the student population comes from families with income levels below the poverty line; (b) within the top 25% of a state's schools as ranked by the number of unfilled teaching positions; or (c) located within urban or rural areas with relatively high-performance teachers who are not certified or licensed, who teach out of field, or teach in schools with high teacher turnover rates. These schools also have to deal with students with limited English proficiency and high student mobility (Jacob, 2007). In a 2014 study for the National Center for Education Statistics, a *high-poverty school* was defined as

> A school where more than 75 percent of the students are eligible for free or reduced-priced lunch (FRPL) and low-poverty schools were defined as public schools where 25 percent or less of the student population are on FRPL, and mid–low-poverty schools were defined as those with 25.1 to 50 percent of their students on FRPL. (Kena et al., 2014, p. 74)

Petty, Fitchett, and O'Connor (2012) defined a *high-poverty school* as one in which "at least 80 percent of the children in the school attendance area are from low-income families or at least 80 percent of the student enrollment are from low-income families eligible to receive federal Title I funds" (p. 70). According to Glander (2017), during the 2015–2016 school year, 24% of America's public school students attended high-poverty schools. The increase in high-poverty schools is creating an environment in which more and more students are at an academic disadvantage and are learning less. These statistics also emphasize the importance of being able to identify and place the best credentialed teachers in these schools. Unfortunately, trying to attract what may be considered an effective teacher to teach in a high-poverty school is not easy.

In high-poverty schools, principals have little autonomy in recruiting and hiring effective teachers (Papa & Baxter, 2008). As a result of the perception of failure, principals cannot have their pick of what would be considered top teaching prospects (those with a wealth of experience, advanced certification, and advanced degrees; Glazerman & Bruch, 2011). The

percentage of first-year teachers at high-poverty schools is almost twice as high as at low-poverty schools (Haycock & Hanushek, 2010). Odden (2011) identified six of the worst problems plaguing high-poverty schools:

- Lack of comprehensive and strategic human management;
- Historic inability to recruit the best and brightest into education;
- Difficulty staffing high-poverty schools, too many of which have excess numbers of unqualified and ineffective teachers and principals;
- Chronic shortages of teachers in such subjects such as math, science, and technology;
- High teacher turnover;
- Compensation systems that pay teachers for factors unrelated or weakly related to effective instruction or gains in student learning. (p. 9)

Any school with these problems will find it extremely difficult to succeed, especially if it has a principal who lacks vision and does not know what to look for when making the important decision of screening and selecting teachers.

When teachers leave high-poverty schools, they are often replaced with inexperienced novice teachers, long-term substitutes, or teachers with alternative teaching certificates (Amrein-Beardsley, 2012). Papa and Baxter (2008) concluded that principals of high-poverty schools are at a disadvantage as a result of their inability to recruit and hire highly qualified teachers. Over the years, several efforts have been made to make sure every school has high-quality teachers.

The Elementary and Secondary Education Act

The reason NCLB passed the requirements for highly qualified teachers was because rural and urban communities were finding it difficult to hire highly qualified teachers (Saultz, White, McEachin, Fusarelli, & Fusarelli, 2017). In 2015, the Every Student Succeeds Act (ESSA) was passed and reauthorized the Elementary and Secondary Education Act. ESSA replaced NCLB and eliminated the highly qualified teacher provisions of NCLB. ESSA requires that state education agencies and LEAs be responsible for improving the quality and effectiveness of teachers, paraeducators, principals, and other school leaders with the aim of

increasing student academic achievement (Cross, 2016). The new law places the responsibility on states to determine their own definitions of *teacher credential standards* (Saultz et al., 2017). In the district studied, the state maintained the definition that teachers are qualified if they (a) possess a bachelor's degree from an accredited college or university, (b) complete a state-approved teacher preparation program, and (c) pass required Praxis exams. One of the main goals of the ESSA qualification requirements was to ensure principals at Title I schools are no longer being forced to staff their buildings with ineffective and out-of-field teachers. The goal was to allow states to create their own teacher qualifications and get more of these qualified teachers into schools that need them.

Screening and Selection of Teachers

Teacher selection processes are most reflected in the classroom through student outcomes (Rinehart & Young, 1990). How students perform determines whether a hire has been successful. A poor selection can deprive students from receiving an adequate education (Clement, 2009; Rinehart & Young, 1990; Schumacher et al., 2015). When undertaking the process, most administrators make screening and selection decisions based on résumés, applications, letters of recommendation, credentials, and interviews (Engel & Finch, 2015; Rinehart & Young, 1990). Screening involves eliminating applicants who do not meet the requirements set by the employer and compiling a list of applicants who will be interviewed (Cranston, 2012; Rinehart & Young, 1990). Liu et al. (2008), in their study of the hiring of mathematics teachers, stated urban principals looking for teachers based on a list of "desired criteria" (p. 316) might be on an "impossible quest" (p. 316) resulting in a small supply of effective candidates. Mason and Schroeder (2010) explained that principals lack a value system based on specific criteria to screen potential hires.

Young and Fox (2002) defined *selection* as a process that involves "at least two decisional points that must be satisfied successfully to consummate an employment contract" (p. 532). The first point comes through the screening process, the second through the interview process. Young and Delli (2002) stated the goal of teacher selection is "to acquire from a pool of willing and able candidates, only those highly qualified for performing their assigned duties in the classroom setting" (p. 587). Despite efforts to make the screening and selection process one that would lead to hiring an effective candidate, studies have shown many school systems do not have a research-based approach to screening and selecting teachers (Boyd, Goldhaber, Lankford, & Wyckoff, 2007). As a result of not having such an approach, those in charge of hiring (principals, assistant principals, department chairs, and staff development teachers) use different means to validate their screening and selection processes. According to Young and Prince (1999), selecting teachers should be a process free of bias and one that utilizes the best talent available in the applicant pool. The researchers also contended selection without bias seems to be the rule rather than the exception (Young & Prince, 1999).

Young and Miller-Smith (2006) hypothesized high-performing schools make different teacher screening decisions than low-performing schools. In their study using hypothetical candidates, the researchers found no difference in the decision-making processes of the two types of schools (Young & Miller-Smith, 2006). However, Young and Miller-Smith concluded low-performing schools may not have the access to the same types of candidates as high performing schools. Engel and Finch (2015) found principals in low-performing schools were more likely to hire substitutes and student teachers. In their study of rural versus urban high schools, Little and Miller (2007) hypothesized that applicants are selected based on the preexisting values of the school system rather than the strongest qualifications. Without some kind of unified structure,

selecting based on local norms and biases would increase the status quo, and do little in the way of increasing student achievement (Little & Miller, 2007). According to Young and Fox (2002), research on prescreening decisions has relied on creating hypothetical applicants, examining their credentials, and simulating the decision-making process during the screening stage of the hiring process.

In the district examined in this study, the screening and selection process consists of applicants submitting their résumés online or presenting to recruiters at job fairs (Jacobson, 2014; Meyer, 2009). The district also holds job fairs for teachers looking to change school locations within the district. Also, at the end of every school year, the district screens, selects, and hires recent college graduates as well as applicants from other districts. The human resources (HR) department scans and reviews each applicant to make sure he or she meets the standards of a *highly qualified teacher* as defined by the state and the district. Candidates then go through prescreening interviews either by phone or in person. When a vacancy opens, the names of the candidates are forwarded to the principal (Meyer, 2009).

Teacher Credentials

Teacher credentials are those qualifications that can be affected one way or another by policy, either through incentives to induce teachers to change their credentials (e.g., offering higher pay to teachers with a master's degree or doctorate), by setting rules on who can become a teacher (e.g., licensing requirements), or by formal or informal decisions that determine how teachers with stronger or weaker credentials are distributed among schools (Clotfelter et al., 2007). With spending on teachers' salaries constituting a large share of education budgets, it is important for policymakers to determine if they are getting positive returns on their investment. Similar to *Moneyball*, the best teachers with strong credentials tend to teach in the best schools

with more advantaged, higher performing students (Berry, 2008; Clotfelter et al., 2007). One would assume a teacher would rather make the same amount of money teaching at a school with high-achieving students than struggling at a school teaching low-achieving students. Teacher salaries and job growth are based on years of experience and number of advanced degrees. Teachers who have these credentials are the ones who are considered the must-haves by schools, and the ones who can have their pick of schools. In most states, teacher salaries are based on years of experience, type of certification, National Board certification, and degrees attained. The selectivity of the candidates' undergraduate institution is another credential that has been examined to assess its impact on teacher effectiveness and student achievement. In their study of teacher credentials and student achievement, Clotfelter et al. (2010) used student achievement data from North Carolina end-of-year exams to find out which of the credentials mentioned had a positive impact on students achievement.

Years of Experience

In the state in which the study district is located, *years of experience* refers to number of years of teaching within the state or another state in which the teacher taught previously. In the district, 12.5% of the teachers on the high school level have less than five years of teaching experience, while 37.% have five to 15 years of teaching experience, and 49.4% have more than 15 years of teaching experience (MCPS, 2017). According to Glazerman and Bruch (2011), teachers with more experience get preferential treatment in being assigned the students they teach, mostly upperclassmen and those in honors and advanced classes. Also, teachers with more experience are favored when competing for vacancies (Glazerman & Bruch, 2011). As a result, teachers with the most experience are at an advantage as they are able to voluntarily transfer from low-performing schools. Without any data on the effects of experience on student

achievement, school districts are placing a premium on a credential for which they have no evidence of its effectiveness.

In their study of North Carolina Public Schools, Clotfelter et al. (2010) found teachers with more experience were more effective than those with less experience. Goldhaber (2007), Harris and Sass (2009), and Kersting et al. (2013) found three to five years of experience had a positive effect on student achievement. Teachers in the first three years were ineffective and were found to show improvements in Years 3–5 (Goldhaber, 2007; Harris & Sass, 2009). In 2011–2012, on average, teachers in traditional public schools had 14 years of teaching experience (R. Goldring, Gray, & Bitterman, 2013). However, according to Rutledge et al. (2008), there may a peak for teachers as their experience and effectiveness no longer have an impact on student achievement after three to five years.

State Certification

Teacher certification, or licensure, serves as proof that a teacher is allowed to teach in the state and has met all of the coursework and testing requirements. The district studied has three types of certificates for teachers: Standard Professional Certificate I, Standard Professional Certificate II, and the Advanced Professional Certificate. In the district, 18.8% of the high school teachers have standard certification and 71.5% have advanced certification (MCPS, 2017). All of the certificates are valid for five years. Movement from one certificate to the next is determined by years of experience, professional development over the five-year period, and completion of an advanced degree or National Board certification. In examining the Cleveland, Chicago, and Milwaukee school districts, Peske and Haycock (2006) surmised teacher certification is not a strong predictor of student achievement. However, Clotfelter et al. (2010) found teachers with

standard certificates or higher, which would correlate with three to five years of experience, in North Carolina had a positive effect on student achievement.

National Board Certification

The National Board for Professional Teaching Standards is a rigorous, nationally recognized certification program. National Board certification is a process of a year or more in which teachers are required to take an exam and complete a variety of tasks, which are recorded and reflected in a portfolio. To be eligible for National Board certification, a teacher must have three years of experience and a valid teaching certificate (MCPS, 2014). As of 2014–2015, there were 252 National Board-certified teachers (NBCTs) in the district's high schools (MCPS, 2014). Clotfelter et al. (2010) and Goldhaber and Anthony (2007) found teachers with National Board certification are more effective not only when they achieve it but also while they are going through the process. The conclusions from these studies suggest teachers become better practitioners as a result of the National Board certification process and have more of a positive impact on their students' learning and achievement.

Degrees Attained

Along with experience and types of certification, the teacher's degree is also a credential used to measure teacher effectiveness and determine salary. A teacher's salary in the district studied is determined by whether he or she has a master's degree, doctorate, or other advanced degree or coursework. During the 2016–2017 school year, 7.7% of high school teachers in the district had a bachelor's degree, 25.2% had a master's equivalent, 64.9% had a master's degree, and 2.0% had a doctorate. In their study using data from the 1988 National Educational Longitudinal Study, Goldhaber and Brewer (1996a) found math and science teachers with master's degrees in those subjects had students who achieved higher on standardized tests than

students whose teaches had only a bachelor's degree. In their study of school systems in Cleveland, Chicago, and Milwaukee, Peske and Haycock (2006) also found that advanced degrees were effective on student achievement only for math and science teachers. Researchers found no significant changes in history and English (Engel, 2013; Goldhaber & Brewer, 1996a). These findings would suggest technical subjects such as math and science need more specific sets of knowledge because of the technical aspects involved in teaching students those content skills. While these credentials have been used traditionally in determining teacher salary, Clotfelter et al. (2010) and Engel (2013) concluded teachers with advanced degrees have little effect on student achievement.

Quality of Undergraduate Institution

Another credential that has been used to measure teacher effectiveness is quality of the undergraduate institutions teachers attended for their teacher preparation. Ehrenberg and Brewer (1994) did a longitudinal study using *Barron's Profiles of American Colleges* to examine the correlation between college selectivity and student achievement. Basing their study on the 1966 *Coleman Report*, Ehrenberg and Brewer (1994) found, by using undergraduate institutes as a proxy for Coleman's examination of teacher test scores and verbal ability, the selectivity of an undergraduate institution did not have an effect on student achievement.

Using data from *Barron's Admissions Selector*, Clotfelter et al. (2010) examined which undergraduate teacher prep programs were competitive, uncompetitive, very competitive, or unranked. Their findings suggested teachers from competitive undergraduate schools were, on average, more effective than those from schools classified as uncompetitive. However, Ballou (1996) found attending a highly selective university was not a criterion on which principals placed importance when screening and selecting teacher candidates.

Predictive Analysis and Human Resource Management

Research on principals' hiring practices suggests that, even with schools becoming more data-driven, teacher hiring remains an information-poor process (Cannata et al., 2017). Using all of the credentials mentioned, principals have to determine if candidates will be effective and whether the candidates' years of experience, advanced degrees, level of certification, and selectivity of undergraduate institution attended are true predictors of student success. If not, then, according to the *Moneyball* theory, what are the credentials that have a positive effect on student achievement? Predictive analysis is one way to examine these data.

Predictive analytics goes by several names in the fields of HR and human capital management. Terms such as *Big Data*, *talent analytics*, *human capital analytics* (Levenson, 2011), *talent intelligence* (Kinley & Ben-Hur, 2014), and, in sports, *Moneyball* (Lewis, 2003), define the practice of trying to predict the potential performance of groups or individuals. Predictive analytics applies techniques from statistics, data mining, text mining, machine learning, and mathematical modeling to predict future outcomes based on historical data. Patterns discovered from data enable businesses to identify future opportunities and risks. In his 2014 State of the School address, the former superintendent of the district studied explained human capital management was crucial to the success of the district (Starr, 2014). He highlighted the importance of "recruiting, developing, and retaining" (as cited in Starr, 2014, p. 11) teachers, and how important the Professional Growth System (PGS), which sets the standards for high-quality teaching, is in accomplishing that goal.

Predictive analysis is slowly finding its way into education. Odden (2011) suggested the entire HR process of education needs to be restructured in order to maximize instruction and student achievement. Predictive analysis should be used to identify teacher talent and

strategically place that talent in schools that have the most need (Odden, 2011). Applying predictive analysis through a corporate lens, Wolfe, Wright, and Smart (2006) stated hiring decisions entail "identifying relevant knowledge, skills and abilities and developing measures that validly assess those characteristics" (p. 113). Wolfe et al. believed using data to predict performance decreases emphasis on professional discretion and increases emphasis on statistics. A predictive analysis relies on being objective and eliminating the use of guessing, instincts, or gut feelings to make major decisions. In institutions such as educational institutions, which are bound by tradition, established processes become stagnant and reinforce the status quo (Wolfe et al., 2006). Doing things based on the mantra of "that is how it has always been done" can no longer be accepted by those looking to reform the hiring process.

Hiltrop (1999) identified five HR management practices that separate the successes from the failures:

> [a] They recruit continuously, rather than simply filling openings when they are about to occur, [b] They are good at specifying the type of people and qualities they need for their business, [c] They put talented people in challenging jobs before they are ready for them, [d] They view mentoring and coaching as essential training and career development, and [e] They do not allow poor performers to stay in position for years (p. 424)

Hiltrop suggested organizations use data to identify the type of talent for which they are aiming, and make sure the recruitment of that talent fits the needs of the organization. Using objective data in recruitment can lead to reduced turnover and improved performance (Kinley & Ben-Hur, 2014).

Conclusion

Principals have a responsibility to their students to provide the best teachers for them. A poor hiring decision can have a negative effect for years not only on the students but on the school as well. Since Coleman attempted to identify the credentials associated with student

achievement in 1966, laws have been enacted to define *effective* and *high-quality* teachers. Studies that have been conducted to identify the credentials positively associated with student achievement have shown that having a bachelor's degree, attending a competitive undergraduate program, having three to five years of teaching experience, having standard certification, and having National Board certification are the credentials on which principals should place value when screening and selecting teacher candidates. Similar to the needs of low-budget teams in *Moneyball,* predictive analytics is the key to helping principals make more informed hiring decisions. The next chapter provides an examination of school leaders' different methods of screening and selecting teacher candidates, none of which are based on research.

Chapter II

Empirical Examination of the Problem

Information gathered from the literature review revealed the credentials that have a positive effect on student achievement are (a) a bachelor's degree from a highly competitive university (Clotfelter et al., 2010), (b) three to five years of experience (Goldhaber, 2007; Harris & Sass, 2009; Kersting et al., 2013), (c) standard state certification (Clotfelter et al., 2010), and (d) National Board certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007; Harris & Sass, 2009).

A needs assessment was conducted to get an understanding of what credentials and decision-making processes school leaders in the district under study used when screening and selecting teacher candidates. Many principals in the district work with their instructional leadership team to interview candidates. The principal or assistant principal pulls the candidates from the application tracking system and brings the candidates in to be interviewed. In a round table interview, the principal and/or assistant principal is usually present as well as the chair of the department in which the position is open, along with the staff development teacher and possibly team leaders or classroom teachers.

In approaching this study to determine how principals decide on teacher candidates, the researcher decided to get the insights on hiring decisions from those who are privy to the decision making. An e-mail was sent to various assistant principals and department chairs in the district (n = 20). To understand the thought processes of those charged with shaping a school's staff, participants were also sent a list of mock candidates and credentials that would been seen by administrators when pulling candidates from the applicant tracking system (ATS). Sent in the form of an Excel spreadsheet, the credentials were based on real résumés of those who have

applied for English, social studies, or math positions in the district. Included on the chart were the following:

- Applicant's name (a pseudonym)
- Subject taught
- Years of experience
- Undergraduate and graduate school attended
- Subject in which the applicant received his or her highest degree
- Whether the applicant speaks a foreign language
- Type of state certification
- Race and gender

The e-mail asked participants, Which of these candidates would you bring in for an interview and why? The screening process in the district requires applicants to complete an application and post their résumés online. If the applicant passes the initial screening, his or her résumé is posted in the system for administrators to review and possibly contact for an interview.

Findings

In examining the participants' responses to the mock ATS, drastic differences became apparent in how administrators approached the screening and selecting of teacher candidates. Following are the responses of some of the school leaders who examined the lists of mock applicants.

School Leaders' Responses Regarding Mock English Applicants

Table 1 provides a list of the mock English applicants.

Table 1

Mock English Applicants

Pseudonym	Yrs. of exp.	Undergrad	Graduate	Highest degree	Bilingual	Certification	Race	Gender
Basil	10	Clemson	Loyola	Master's in education	No		White	M
Earle	20	North Carolina Central University	Bowie State	Master's in English literature	No	Advanced Professional	Black	F
Herring	0	West Virginia	West Virginia	Master's in secondary education	No		White	M
Marteen	0	University of Maryland	N/A	Bachelor's in English	No	Standard Professional 1	White	M
Murray	7	University of Pittsburgh	University of North Carolina	Master's in secondary education	No		White	M
Priest	9	University of Maryland	University of Maryland	Master's in secondary education	No		White	F
Mowan	0	University of Maryland	University of Maryland	Master's in curriculum and instruction	No		White	F
Simms	18	McDaniel College	McDaniel College	Master's in curriculum and instruction	No		Black	F

Following are the responses of some of the school leaders who examined the list of mock English applicants.

Assistant principal (Asian male).

From the information provided, I would likely hire Earle, the English teacher, who has over 20 years of experience. The fact that he has considerable number of years as a teacher should provide a wide range of courses he is experienced in teaching. As such,

the implied versatility is a factor for the candidate so that he could teach a range of courses at different grades or levels, depending on our need.

Assistant school administrator (African American female).

In order to begin the process, I would look at the needs of the department. Some of the items that I would consider would be:

- The needs of the available position
- Demographics of the department (if possible)
- Experience (not necessarily tied to years of experience but rather career experience. Sometimes, the college experience provides a snapshot of a new innovative teacher)
- Additional skills (i.e., because I work in a tech magnet school, we would keep this in consideration)
- For the candidates that listed previous experience, I would have been curious to look at their previous teacher's locations and recommendations (see trends, etc.).

Assistant school administrator (African American male).

I think it's good to get the new teachers fresh out of school. They can be molded and are open to feedback and are optimistic. I will take a look at this information, but I also like to know what type of populations they have worked with and what grade levels (i.e., experience with students like high-poverty students).

English department chair (Hispanic female).

In practice, I would hope to be able to pull the résumés and the central office scale rankings to help narrow the pool, rather than going on these categories alone. But if going off just these categories as the available criteria were required, here's whom I would pull initially:

1. Earle, because he is a veteran teachers and is a target demographic for increasing teacher diversity to better reflect our students.
2. Marteen and Moween because (though they are new to teaching) I have a strong network at that school for recommendations and references, and they have a county partnership for student teaching, so I'd assume that we could contact schools at which these candidates completed their internships (even if they completed in another district, we have a good network there, too, for references and recommendations).
3. Murray to round out the list of interviewees, with having average teaching experience and bringing an out-of-district perspective.

Again, though, these feel like shots in the dark, since there isn't much more information to help in the selection. If none of those panned out, I'd work with another counterpart (department chair or principal) to do another round. Given how time consuming the process is, I have always been asked to pull about 4 or 5 applicants at a time for interview rounds.

Central office staff member/former assistant principal (White female).

We don't get their demographic information upfront so I wouldn't know that. It's hard to say because I don't know the needs of the particular school. I would base it on balancing the department and staff as a whole. I tend to prefer new teachers because I can mold them into whatever I want to fit my school's needs. Also, they'll stay in the classroom longer.

I'd probably interview the NC candidates since I have that connection too. And the Spanish speaker, and the HBCU [historically Black college/university] alum too. Since we don't get their demographic info, I definitely would look at their résumé to see what diversity they bring to the school. Probably the Michigan/UVA person too because it shows they're smart, but not elitist. Both top schools. I'm a big public university supporter.

School Leaders' Responses Regarding Mock Social Studies Applicants

Table 2 provides a list of the mock social studies candidates.

Following are the responses of some of the school leaders who examined the list of mock social studies applicants.

Social studies department chairperson (African American male).

Ok . . . wow! Let's see . . . 2 White females and 4 White males . . . none speak a foreign language?! And this is the only info I have to go on!? I don't know their ages or other experiences!? . . . hmmm . . . Mr. Fissure has 18 years of experience plus a master's in curriculum and instruction . . . so she has the experience edge plus a higher degree in how to instruct. Schneider has five years of experience but no higher degree. I seem to lean towards the higher degree . . . not always worried about experience if they are young or have had a prior career that might help them. In my department now, I have more males than females, so I would lean towards a female in this case . . . of course wish I had a bit of racial/ethnic diversity.

So Burse and Glasser are out because they have no experience and only a BA. I will pass on Schneider because he also only has a bachelor's, despite five years' experience. Glenn has a master's in sec ed but Donnie has a master's in secondary social studies . . . more focused, so I will lean towards Donnie. So it looks like it is between Donnie and Fissure. I like that Donnie is focused on secondary social studies. If she is young, I may go with her. Fissure has a lot of experience.

Table 2

Mock Social Studies Applicants

Pseudonym	Yrs. of exp.	Undergrad	Graduate	Highest degree	Bilingual	Certification	Race	Gender
Burse	0	Towson University	N/A	Bachelor's in secondary education	No		White	M
Donnie	0	University of Kentucky	University of Kentucky	Master's in secondary social studies	No		White	F
Fissure	18	State University of New York at Buffalo	University of Phoenix	Master's in curriculum and instruction	No	Standard Professional 1	White	F
Glasser	0	University of Maryland, College Park	N/A	Bachelor's in journalism/ political science	No		White	M
Glenn	0	James Madison University	James Madison University	Master's in secondary education	No	Standard Professional 1	White	M
Schneider	5	Florida State University	N/A	Bachelor's in social science education	No		White	M

Assistant school administrator (Hispanic female).

Burse—degree in education and went to Towson, which is close to Baltimore and has a bit of diversity; also means he could have student-taught in BCPS [Baltimore County Public Schools]. Glasser—I'm a Terp (also means he's familiar with the area) and the journalistic/political background could make for some good discussions in class.

School Leader's Responses Regarding Mock Math Applicants

Table 3 provides a list of the mock math applicants.

Table 3

Mock Math Applicants

Pseudonym	Yrs. of exp.	Undergrad	Highest degree	Certification	National Board certification
C1	3	University of Illinois	Bachelor's	Standard	No
C2	20	Towson University	Doctorate	Advanced	Yes
C3	11	Goucher College	Master's	Advanced	No
C4	6	Notre Dame, MD	Master's	Standard	No
C5	10	Johns Hopkins	Bachelor's	Advanced	Has been through process
C6	0	University of Maryland, College Park	Bachelor's	Standard	No

Following is a response from a math department chair who reviewed the mock math applicants.

Math department chairperson (Hispanic female).

> I would prefer the last candidate . . . the person who is most likely a recent graduate and can be molded in line with the vision and mission of the school district, my school, and my own philosophy. Some of the best experiences I have had with a teacher are when they are brand new and don't have the comparison factor of how another school or school system or department chair has done things in the past. My 2nd choice would be the candidate with 10 years of experience. Looking for a position with 10 years looks like they would likely want a change and they might still be new enough to the profession that they are not vetted in their way and can still be influenced by different school system's philosophies. Ironically, the candidate that I would least likely select is the one with over 20 years of experience and the doctorate. They are probably set in their ways and possibly not open to new ideas.

Discussion

The responses of the participants and their decision-making processes were synthesized into the following observations:

- preferences for those who have taught in diverse environments,
- need to have demographic information upfront (race, gender),
- preference for advanced degrees (master's degrees and doctorates),
- years of experience is a factor,
- years of experience is not a factor,
- new teachers can be molded by the department chair and principal,
- speaking a foreign language (Spanish) is important,
- preference for candidates who would be a good fit for the school, and
- preference for familiarity with the applicant's undergraduate school.

In hiring effective teachers, the screening and selection process is an important task toward school improvement (Mason & Schroeder, 2010). Screening for the best credentials along with the attitude, beliefs, and disposition of the applicant is important in not only hiring but also retaining the best applicant (Leithwood, Harris, & Strauss, 2010). Heneman and Milanowski (2004) contended placing the best teachers in front of students is the first step in closing the achievement gap.

The responses of the participants in this needs assessment offered the researcher the opportunity to observe the different ways school leaders come to the crucial decision of hiring staff. The responses also made the researcher wonder even more whether principals also used these same screening and selecting practices. These school leaders, who may have aspirations to one day be principals themselves, will use these experiences and lack of knowledge to justify hiring candidates in the future.

Responses were scattered, and none were pulled from any research-based evidence. It was interesting to see the participants' thought processes of how they justify why they would

select one applicant over another. While the applicant's interview plays a major role in the hiring process, an administrator would want to make sure he or she is bringing the best possible candidates to the table. Leithwood et al. (2010) stated principals must have the capacity and disposition needed to solve the school's challenges. The problem with the responses by those who participated is that none of their decisions was based on research. All of the participants used gut instinct, familiarity, and their own personal experiences to decide who would be best to improve student achievement. This study, and the proposed intervention, aimed to prove that creating one's own standards of hiring, that are not research-based, is not acceptable when so much is at stake.

Several interventions were considered for this study in how to address the issue of screening and selection, and how to get school leaders to be cognizant of the credentials that increase student achievement. One consideration was to examine and implement a new ATS for the district that would disaggregate and place emphasis on those credentials that positively affect student achievement. Another idea was to urge the district to start a Grow Your Own Teacher program. Grow Your Own Teacher programs would provide opportunities to secondary school students who are interested in teaching and are given training while in high school (Swanson, 2011).

Based on the feedback and data from the needs assessment, the researcher concluded none of the aforementioned initiatives would get to the root of the problem. These initiatives are pointless if principals and administrators are unaware and lack the capacity to make knowledgeable decisions on who they should hire for their schools, and why. The proposed intervention, therefore, was to offer a professional development for administrators in which they would be trained on identifying the qualities and credentials they should be looking for in

screening and selecting teacher candidates, and how to build the capacity of the teachers they already have on staff. In Lewis's (2003) *Moneyball,* once the Oakland A's were able to identify the qualities that were undervalued and that led to team success, they created a cultural initiative throughout the organization to make sure every player was given specific training in those skills.

This research is important in that it speaks to and challenges the way in which teachers are trained, hired, and compensated (years of experience, advanced degrees). In observing that only four of the 24 mock applicants were minorities, the data also raise the need to look at the diversity of teaching staff and how important it is for minority students to see teachers who look like them.

Implications and Conclusion

While all new teachers are not ineffective, and not all experienced teachers are effective, or have a master's degree or doctorate, the intent of this study was to provide principals with data on the credentials that correlate with student achievement. The goal was to help principals to make better decisions during the screening and selection process. The next step would be to use the data collected from this study to make sure those teachers with the best credentials are equally distributed among low-poverty and high-poverty high schools. Stronge and Hindman (2003) suggested district HR departments screen applicants by mining for the credentials that are most effective. The researchers suggested examining whether an applicant majored or minored in the subject being taught, as well as pedagogical courses taken (Stronge & Hindman, 2003). Predictive analysis may prove a more effective means in determining the credentials of the average teacher and forming a baseline to evaluate potential hires.

In the next chapter, the researcher discusses the principal professional development intervention that was conducted during the end-of-year hiring season in June 2018 to provide the

principals of the high-poverty high schools in the district with information on the credentials most associated with student achievement. The intervention was also done to provide principals with training on how to make more informed decisions when screening and selecting teacher candidates. Once current principals are trained, the professional development should be used for new principals and those staff members going through the district's administrative certification programs offered by local colleges.

Chapter III

Intervention Literature Review

The previous chapter included a discussion of the needs assessment that was conducted and the findings. The findings from the needs assessment suggested the need for an intervention that examines principals' preferences in teacher credentials and the decision-making processes used to screen and select candidates. This chapter provides a discussion of the literature concerning the candidate screening and selection process, principal professional development, decision-making theory, and the proposed intervention.

Recent research suggests in order to raise student achievement, schools must employ effective teachers (Feldman, 1996; Hallinger et al., 2014). The challenge is that the most effective teachers are not working in the schools with the students who demonstrate the most need (Glazerman, Protik, Teh, & Bruch, 2013; Goldhaber, 2007; Peske & Haycock, 2006). Some researchers suggest a high-quality teacher can have the greatest impact on student achievement (Harris, Rutledge, Ingle, & Thompson, 2010). According to Goldhaber, Grout, and Huntington-Klein (2014), teacher effectiveness is estimated to raise student achievement by 0.10 to 0.25 standard deviations on state reading and math exams. This means if a principal can screen, select, and hire an effective teacher, then it could have a profound effect on student achievement in the long term by impacting their preparation for institutions of higher education, and possibly influencing their future career earnings (Goldhaber et al., 2014). When examining the teacher characteristics most tied to student achievement, the teacher screening process can give principals a foundation to confidently select those teachers who they feel are the best fit for their schools.

Principals should be able to improve student outcomes and close achievement gaps by focusing their efforts on screening and selecting the best teachers (Cohen-Vogel, 2011). The role of principals in the era of NCLB, and now ESSA, is no longer one of simply implementing and managing programs sent down by district policymakers (Hallinger, 1992); the role of the principal today is that of instructional leader. Principals are now required to have knowledge of curriculum and instruction, and have a say in educational improvements such as identifying and hiring effective teachers (Hallinger, 1992).

In an early study of the teacher screening process, Bredeson (1983) examined the role principals play in the screening and selection of potential teachers. According to Bredeson, the principal serves as the primary decision maker when screening and selecting candidates. In the study, Bredeson created a file of a hypothetical social studies teacher that contained information about the candidate's academic background, college GPA, types of certification, educational work experience, and letters of recommendation of various lengths and content. The study was done with 160 randomly selected high school principals. Bredeson concluded that with so many variables to consider in the screening process, principals need to consider a rating system in which they would give "various kinds of applicant information different weights or values depending on its relationship to and impact on prestated performance expectations" (Bredeson, 1983, p. 25). Bredeson suggested a reliable system and method of making personnel decisions be created based on various sources of candidate information. With the accountability imposed by NCLB and ESSA, principals are required to provide students with the best teachers who can positively affect achievement. The teacher screening and selection process must be based on more than instinct or a gut feeling. Poor hiring decisions can have long-term negative consequences for the school and its students (Rose et al., 2014). It is easier to get the hiring

decision right during the screening and selection stage than trying to "fix" (Rose et al., 2014, p. 13) a poor or underperforming teacher in the future.

Purpose of the Intervention

Many school districts lack a structured system for screening and selecting potential hires (Little & Miller, 2007). Teacher screening and selection is important to student success. Principal professional development should focus on the screening, selection, and hiring decisions school leaders need to succeed in low-performing schools (Simon & Johnson, 2015). Under NCLB (2002) were measures of annual yearly progress that school districts used to identify school success. Principals of high-poverty schools faced greater pressure to turn around these schools. Under ESSA, annual yearly progress was eliminated; states are now required to establish their own benchmarks of success in holding schools accountable (ASCD, 2016). Under ESSA (2015), school success is now measured based on the following criteria:

- results on state standardized tests in reading, math, and science;
- English language learner proficiency; and
- graduation rates.

If student achievement and school improvement start with hiring effective teachers, then it is important for principals to be able to identify and reflect on the decisions they make during the hiring process. Through professional development, principals may be able to improve the way they make screening and selection decisions, by taking part in activities that simulate the screening process, identify the criteria they should use in the selection process, and require them to reflect on their decision-making processes. Through this process, principals would make more knowledgeable and informed hiring decisions. The research questions for the intervention are as follows:

RQ1: What criteria do principals use to make their decisions on screening and selecting effective teachers?

RQ2: What skills do principals need in order to make more informed decisions in the teacher candidates they screen and select?

Review of the Literature

Teacher Candidate Screening Process

In their research, Mason and Schroeder (2010) introduced a concept known as "the reduction of uncertainty" (p. 188). They explained principals should be able to have the means to make the best possible decisions in hiring teachers (Mason & Schroeder, 2010). Making the best possible decision with the best information provided reduces the uncertainty of making a poor hiring decision. Harris et al. (2010) identified a set of norms of the hiring process used by most districts, including a spring/summer hiring schedule, a screening stage, and, finally, applicant interviews. The purpose of this set of norms is for the district and school administrators to have a clear process to ensure they are hiring the most highly qualified candidates.

School districts have different approaches to screening and hiring applicants. According to Liu and Johnson (2006), some are *centralized*, in that the school district screens the applicants, and the principals select the applicants submitted to them from that group. In a *decentralized* screening process, principals are given the autonomy to screen and hire teachers for their buildings (Cohen-Vogel, 2011). Liu and Johnson explained the centralized process of hiring typically meets a district's need for a uniform process among all schools. One reason behind a centralized process is to ensure equitable hiring practices. In the district studied, the process is often shared between the central office and the principal, after an initial prescreening is done by the central office to determine if the applicant is highly qualified (MCPS, 2016). When using a

standardized screening instrument, a school district enhances the reliability of the selection process (Wise et al., 1987). However, by enabling the people who are most familiar with the requirements of a particular teaching position and expertise within a particular field to assess candidates, the validity of the process is increased (Wise et al., 1987). Giving principals the autonomy to screen and select their own teachers provides a level of ownership that allows principals to more easily create the climate and culture they desire.

To make these informed decisions, principals need proper training and access to relevant information in personnel selection (Bredeson, 1983). School-level involvement in the screening process influences teacher selection (Wise et al., 1987). If principals and teachers are significantly involved in screening for academic qualifications, then teacher selection outcomes may differ significantly (Wise et al., 1987). At the school level, principals can screen and select based on the specific needs of their schools. Objective screening procedures help eliminate unqualified applicants from the applicant pool as well as enable the district to treat large numbers of applicants independently (Wise et al., 1987).

Bredeson and Caldwell (1987) found applications were an important tool in the selection and screening of teacher candidates. Even though the application process is a low-cost, simple process, it still provides important information on job experience and educational background (Bredeson & Caldwell, 1987). This process is in comparison to the methods of teacher screening that may be costly to implement, such as commercial teacher selection instruments that still may not be reliable in predicting teacher performance. Districts must find a balance between screening tools that are inexpensive and provide reliable information (Wise et al., 1987). In their study of Spokane Public Schools, Goldhaber et al. (2014) found their 21-point screening rubric from application to interview was able to narrow down the 2,669 applicants for 521 positions,

and provide a standard in which to better predict teacher effectiveness. This rubric is in comparison to principals simply picking candidates they believe may be effective based on subjectivity. Goldhaber et al. concluded the objective information obtained through the application process used was responsible for an increase in math and reading achievement.

Applicant Tracking System

The screening and selection processes used by principals must be reliable in identifying candidates who can create high-achieving students (Bredeson & Caldwell, 1987). HR departments, hiring managers, and recruiters use an ATS to streamline the recruiting process and make the screening and hiring process faster in order to hire the best applicants (Schlinger, 2014). In the district studied, the ATS is defined as "the system Hiring Managers use to post job vacancies (requisitions), view candidates' profiles and manage the hiring and/or transfer processes for those posted requisitions" (MCPS, 2014, p. 3). By using this computer-based technology, the Office of Human Resources and Development (OHRD) can easily and cost effectively screen, select, and hire the most qualified job candidates (Schlinger, 2014). This system can help the OHRD find candidates who match the district's and school's qualifications and needs without wasting hours reviewing piles of applications (Schlinger, 2014). By automating the hiring process, schools increase speed and efficiency, and save on costs (Schlinger, 2014). The ATS also supports the direct search for potential candidates in applicant databases or talent pools (Laumer, Maier, & Eckhardt, 2015). The ATS can help in selecting the best candidates for open teaching positions, whether they are new or transfer teachers, if HR and principals know what they are looking for.

According to the district's careers website (MCPS, 2016), teacher candidates use the website to apply for the job they want and then upload their résumés. Principals submit vacancies

for positions in March (MCPS, 2016). The OHRD then prescreens the applicant to see if he or she is highly qualified for the position (has a bachelor's degree and proper certification, and proficiency in the appropriate subject area). If the applicant is considered a viable applicant, then he or she goes through a prescreening interview with the OHRD. The applicant is then contacted by a principal for a school-based interview, in which the principal screens and selects the applicant through the ATS (MCPS, 2016). According to Bredeson (1983), a tool like the ATS provides a system that allows for those in charge of screening and hiring to assess and compare candidates. As with any system, it must be monitored and tweaked along the way to meet the needs of the district and schools. Addressing the needs of principals when it comes to screening and selecting teacher candidates raises the question of whether principals know what they are looking for when hiring teachers. What criteria are they using? What is the basis for their decisions?

The Need for Principal Professional Development in the Screening of Teacher Candidates

One of the most important and direct contributions a principal can make toward improving student achievement is screening and selecting effective teachers. Brewer (1993) argued the major route through which principals affect students is through teacher selection. As the leaders of their buildings, principals take on the burden of school accountability (Hess & Kelly, 2005; Salazar, 2007). In some cases, principals are ill prepared to make the crucial decisions needed to meet the standards set by their states and districts. Principals must know how to make appropriate data-driven decisions (Keith, 2011). Few studies have examined the in-service professional development of school principals. According to the National Staff Development Council (2000), principals need up-to-date training to stay in touch with current

trends and remain effective. Hallinger and Heck (1998) argued that when conceptualizing the role of principals, the principal should be viewed as the independent variable and student achievement as the dependent variable because principals can impact student achievement through the actions and decisions they make, which affect the school. Principals need continuous professional support in order to properly implement newly gained information and build capacity (National Staff Development Council, 2000). Principals need multiple opportunities to upgrade their knowledge and skills (Salazar, 2007). These opportunities, through professional development, should be tailored to principals' needs and geared toward improving leadership (Salazar, 2007). Fenwick and Pierce (2002) asserted principal professional development must be planned, focused on improving the achievement of students, and promote reflection.

Grissom and Harrington (2010) described principal professional development programs as "formal opportunities for continuing education that principals or other administrators undertake in conjunction with their job responsibilities" (p. 585). The purpose of professional development is to build the leadership capacity of the principal in an effort to improve the effectiveness of the school (Grissom & Harrington, 2010). In their study, E. B. Goldring, Preston, and Huff (2012) synthesized the literature on professional development and found four common elements:

- It must be job-embedded so leaders can apply their expertise in school contexts
- It must recognize the various needs of principals at various points in their career
- The professional development has to be long term and offer multiple opportunities in various formats
- The professional development must be coherent, and must use curriculum that relates to and reinforces key ideas that leaders encounter. (p. 225)

Professional development needs to be transformational and designed to lead the participant (principal) toward understanding and application of issues and practices (Haar, 2004). Principal professional development can come in the form of university course work, mentoring, or

principal professional learning communities (Grissom & Harrington, 2010). Common practices in principal professional development include programs that are topic-specific and content-loaded (Caldwell, 1986). However, these opportunities need to be worthwhile to help principals improve their efficacy as leaders.

Mason and Schroeder (2010) agreed, suggesting that making a wise and informed hiring decision can add value to a school's culture and increase student achievement. In the case of this study, principals of high-poverty schools need support in screening and selecting effective teacher candidates for their schools. Stronge and Hindman (2003) stated identifying the characteristics of effective teachers can give principals a solid foundation for screening candidates. Mason and Schroeder noted that for most districts, there is no specific criteria to separate and rank teacher candidates.

Boyd, Lankford, Loeb, Ronfeldt, and Wyckoff (2011) found little research on whether principals make good hiring decisions. However, Stronge and Hindman (2003) argued a well-constructed selection process helps schools hire teachers who have the qualities and credentials that enhance student achievement. Many school districts lack a research-based approach for identifying and selecting teachers (Walsh & Tracey, 2004). Without some sort of criteria, hiring teachers becomes based on personal biases, gut feelings, and instinct. A decision as crucial as hiring teachers should be thoroughly supported with research-based evidence (Walsh & Tracey, 2004). Understanding the dynamics of personnel selection is crucial if principals are going to be committed to improving student achievement (Cranston, 2012). Unfortunately, it is principals' subjectivity, rather than objective criteria, that plays a significant role in hiring teachers (Harris et al., 2010).

Principal Professional Development in the District

In the district, principals are evaluated every three years (MCPS, 2015a). During that time, they are expected to participate in professional development every month during their administrator and supervisory (A&S) meetings. The guiding standards in the evaluation of principals nationwide are the Interstate School Leaders Licensure Consortium standards (MCPS, 2015a). These standards, which are based on six guiding statements, present common criteria of knowledge and performance that connect administrators to educational outcomes. A&S staff are expected to adhere to six standards under the district's PGS:

> Standard I: The principal is an educational leader who promotes success for all students as he/she facilitates the development, articulation, implementation, and stewardship of a vision of teaching and learning that is shared and supported by the school community. . . .
>
> Standard II: The principal is an educational leader who promotes success for all students as he/she nurtures and sustains a school culture of professional growth, high expectations, and an instructional program conducive to student learning and staff professional growth. . . .
>
> Standard III: The principal is an educational leader who promotes success for all students as he/she ensures the management of the organization, operations, and resources for a safe, efficient, and effective learning environment. . .
>
> Standard IV: The principal is an educational leader who promotes success for all students as he/she collaborates with the school staff and other stakeholder groups, including students, families, and community members. . . .
>
> Standard V: The principal is an educational leader who promotes success for all students as he/she models professionalism and professional growth in a culture of continuous improvement. . . .
>
> Standard VI: The principal is an educational leader who promotes success for all students as he/she understands, responds to, and influences the larger political, social, socioeconomic, legal, and cultural context. (MCPS, 2015a, pp. 15–27)

These standards highlight the importance that is placed on principals to be instructional leaders. Each of the six standards focuses on how principals must lead their schools toward providing the best opportunities and resources for students to be successful. The intervention for this study involved creating a professional development based on Standard I. The *Administrative & Supervisory Professional Growth System Handbook* (MCPS, 2015a) states the vision for

principal professional development is to "provide a variety of leadership experiences for administrative and supervisory staff that will expand their knowledge, skills, strategies, practices, and beliefs in each of the six standards" (p. 7).

The district provides professional development programs for its principals five times per year. The professional development covers a variety of topics that align with the A&S PGS standards and the district's "strategic priority enhancements" (MCPS, 2015b, p. 3). The enhancements have five foci, one of which is human capital management. The district has made it a priority to look for new and innovative ways to close the district's achievement gaps and prepare students for college and careers (MCPS, 2015b).

The District in Context

When examining what would help principals make more informed decisions in the screening, selection, and hiring of effective teachers, the researcher made the assumption the problem lay with the hiring process employed by the school district. The researcher initially explored the possibility of proposing a restructuring of the district's ATS to screen for viable candidates (Schlinger, 2014). According to Rose et al. (2014), submission of the candidate's résumé to the application screening should be a district's first screening tool. Screening through the résumé and application serves as a way of collecting candidate information that can predict teacher effectiveness and screen out the applicants who are least qualified (Rose et al., 2014). Administrators who insist on hiring someone they know, or do not hire candidates with exceptional credentials because of fear of their moving on in a few years, are not making sound, data-based decisions, and could cause major problems in the long term (Clement, 2015). However, the researcher ruled out this approach because, at this stage, the problem is not with

the application system but with principals not knowing what to look for when screening teacher candidates.

Another course of action considered was to develop an intervention around the Grow Your Own Teacher program (Swanson, 2011). The district already has partnerships with many local universities, which allow potential candidates to student teach and possibly get teaching positions in the district. The problem would be that the Grow Your Own Teacher program would focus only on new teachers. When examining screening and selection, the Grow Your Own Teacher program would leave principals without a means to screen teachers who transfer from one school to another in the district, or who may be coming from another district or state. The Grow Your Own Teacher program was ruled out as a solution to the problem explored in this study.

While these other interventions were considered, it was not until the needs assessment that it became clear those interventions would not provide a solution to the problem. Principals need to know the credentials associated with student achievement, and how to justify their selections during the screening process. Several school leaders (principals, assistant principals, assistant school administrators, department chairs) were given a list of mock applicants and their credentials and asked to identify the candidates they would choose and why. From the data collected, it became apparent the immediate problem with screening and selecting effective teaching candidates was not the improper use of the ATS or that low-performing schools should grow their own teachers. The problem seemed to be that school leaders had no process for selecting teachers that is rooted in evidence-based practice. Their reasoning went from “I went to the same undergraduate school they attended” to “Their résumé shows that they are smart, but not elitist.” From the needs assessment, the researcher concluded school leaders lack the capacity

to make knowledgeable decisions on who they should hire for their schools, and why. Based on the analysis of these findings, the proposed intervention was selected in order to offer a professional development session for principals in which they would be trained to identify the qualities and credentials for which they should be looking in an applicant based on the credentials found in the literature review to be effective, and enhance their skills in research-based decision making.

Theoretical Framework

The theoretical framework for this intervention was based on decision-making theory. The intervention, Educational Moneyball, involves training principals to use research-based practices to make skill-based decisions when screening and selecting teacher candidates. The intended long-term outcome is to increase the number of effective teachers in high-poverty high schools. The literature reviewed was based on the query, How do principals make decisions on screening and selecting effective teacher candidates for their schools? Frederick (1963) explained decision-making theory provides insight into the strategic role information plays in making management decisions. Decision-making theory can also lead to a reduction of the role intuitions play in making management decisions, and a reduction in time and energy spent by utilizing new strategies and innovations (Frederick, 1963).

Many decisions made by leaders are made subjectively through gut instinct or intuition. Enriquez-De-La-O (2015) stated gut decisions are shaped by previous experiences; those experiences create patterns and rules that are constantly applied to one's decision making. Meir, Favero, and Zhu (2015) also contended, whether right or wrong, decision makers base their expectations of future success on past experiences. These experiences, expectations, and patterns go unchanged until new information becomes available that challenges those previous beliefs

(Meir et al., 2015). The researchers also pointed out that leaders, or in this case principals, are motivated by and make their decisions based on the performance of their schools (Meir et al., 2015). With that being stated, all decision making is fueled by the recognition of a need for improvement and/or the closing of a performance gap. These performance standards can be set within the school by the principal or by the district, state, or nation (Meir et al., 2015). Citing several studies, Mertz (2010) synthesized the literature on using a decision-making model that would start with (a) identifying the problem or need, (b) generating alternative solutions to the problem, (c) evaluating all the alternative solutions to the problem based on criteria, and (d) choosing the best alternative. The decision-making process can be skewed by political pressure or a lack of time to fully think things through (Mertz, 2010). Criteria would then need to be applied to assess candidates who best meet the criteria (Mertz, 2010).

Barth (1986) synthesized the principal professional development logical training model into four criteria: "[a] reflect on practice, [b] articulate practice, [c] better understand practice, and [d] improve practice" (p. 160). Barth asserted in order for principals to improve and make sound decisions, they must understand the process by which they make decisions. Before a principal can be considered effective, he or she must understand his or her strengths, limitations, and the processes that go into making critical decisions that affect the school, its students, and its staff (Barth, 1986). To create a meaningful and engaging professional development, a variety of strategies need to be implemented.

The school district examined in this study is located in a large mid-Atlantic district. It is considered one of the most successful school systems in the United States (MCPS, 2011). The district consists of 25 high schools with an enrollment of 47,450 students. Eleven of these high schools are labeled low-performing and high-poverty due to their high number of students on

FARMs (Bonner-Tompkins, 2014). The goal of this professional development was to provide the 11 principals with research on effective teacher credentials and the processes to use in making sound human capital decisions when it comes to screening and selecting teacher candidates. Based on the concept explained in *Moneyball: The Art of Winning* (Lewis, 2003), the purpose was to get principals to analyze, reflect, and make informed decisions during the screening and selection process.

Simulation-Based Training

Peterson (2002) stated an effective professional development program must have the following components: (a) clear mission and purpose, (b) curriculum coherence, instructional strategies, linkages to state initiatives and certification, use of information technologies, and a specific length and time structure. Peterson used case studies of several principal professional development programs to find common topics and strategies. Strategies may include experiential learning, small-group work, simulation, role playing, case studies, action research, and developing professional growth plans (Peterson, 2002).

The principals who participated in this program went through a simulation-based training activity in which they had to look at a mock ATS, the same one used with school leaders in the needs assessment, for hypothetical positions in English, social studies, and math. Principals then selected who they would consider to be the best candidate for the position, and capture and share their reasoning. The purpose was for participants to think, analyze, and reflect on their decision-making process.

Professional development for principals involves creating the best practices and making judgments in situations that are complex, unique, and uncertain (Grogan & Andrews, 2002). E. B. Goldring, Huff, Spillane, and Barnes (2009) designed scenarios such as open-ended problems

to increase the opportunities for principals to detail the knowledge and thought processes they might use to address specific problems. The scenarios were focused on situations necessary for instructional improvement. Simulating the teacher screening process and reflecting on their decision-making practices may even lead principals to develop their own methods and tools for selecting candidates.

In the hiring of teachers, a principal may create selection tools in order to interpret a candidate's attributes and to establish an understanding of other attributes that can be gathered and clarified during the interview process (Bolander & Sandberg, 2013). These tools can reduce uncertainty and lay the foundation for the next steps in the hiring process (Bolander & Sandberg, 2013). Bolander and Sandberg (2013) argued selection tools should be developed to facilitate a sense-making process rather than to create objectivity.

The conversations that developed from the simulation-based training allowed participants in this study to reflect, change, and improve the processes they use in screening and selecting teacher candidates. Much like how professional learning communities bring participants together to work on educational issues as a team, principals had the opportunity to interact with each other, share common experiences, and reflect as a group (Grissom & Harrington, 2010). Evans and Mohr (1999) noted principals benefit from "engaging in intellectual dialogue and debate, reading and discussing recent research, and hearing from speakers who might promote new thinking" (p. 532). Principal professional development must create a network of collegial support for participants to exchange ideas and discuss strategies (E. B. Goldring et al., 2012). It is those principals who learn how to reflect and examine their belief systems and create new practices who can bring positive changes to their schools (Evans & Mohr, 1999). From this activity, principals were able to start thinking and creating criteria that are research based. The final

product was the creation of their own teacher selection tool that addressed the needs of their individual schools.

Teacher Credentials and Student Achievement

The professional development introduced the concept of *Moneyball* and how it is used in sports and other professions for human capital management. Participants watched an excerpt from the film version of *Moneyball* that highlighted the indecisiveness and uncertainty that arises when trying to make the right hiring decisions. Participants were asked to reflect on two questions: How is this conversation similar to ones you have had with your instructional leadership team or hiring committee? and When it comes to the screening and selection of teacher candidates, what is the problem with the process? The program then made the connection to teacher credentials, the screening and selecting of teachers, and student achievement. The researcher shared with participants the findings from the literature review conducted on the teacher credentials most associated with positive student achievement: (a) a bachelor's degree from a highly competitive university (Clotfelter et al., 2010), (b) three to five years of teaching experience (Goldhaber, 2007; Harris & Sass, 2009; Kersting et al., 2013), (c) standard state certification (Clotfelter et al., 2010), and (d) National Board certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007; Harris & Sass, 2009).

Job-Embedded Professional Development

Professional development should be focused on leadership needs in context of the job (E. B. Goldring et al., 2012). Everything the participants were asked to do in this professional development was based on what they are expected and required to do in their jobs. Job-embedded professional development refers to educator learning that is grounded in day-to-day practices and designed to enhance the educator's practices (Darling-Hammond, & McLaughlin,

1995). Haar (2004) asserted principals need to engage in simulations and real-life problem solving in order to provide fresh perspectives on current issues.

In the district, the job of the consulting principal is to mentor and monitor the progress of novice, new-to-the-county, or struggling principals (MCPS, 2015a). Consulting principals are assigned to the OHRD to mentor, support, and coach administrators (MCPS, 2015a). In this professional development, the mentor or consulting principal can monitor the teacher selection process and have the principal explain how and why he or she is making certain hiring decisions. Caldwell (1986) suggested coaching helps principals to apply what they have learned in real scenarios and gain immediate feedback. In 56 studies of teacher professional development, when coaching was added to the training, the implementation of the acquired skill increased (Caldwell, 1986).

Reflective Inquiry Approach

Principals should be encouraged to use systematic inquiry to generate their knowledge (Fenwick & Pierce, 2002). Under this approach, principals become active learners through engagement and reflection on their own practices (Fenwick & Pierce, 2002). Fenwick and Pierce (2002) implored that principals "take risks and explore new skills and concepts, and apply their new knowledge and skills in real school contexts" (p. 3). Gningue, Schroeder, and Peach (2014) argued that in professional development, participants can use reflective inquiry to create plans that address problems, and then use the results to analyze the effectiveness of those plans.

The principals in the Educational Moneyball professional development used the activities to reflect on and create their own screening criteria based on the knowledge they gained through reflection, the simulation-based training, and the data shared. In the postintervention survey, participants were asked to reflect on the teacher candidates they screened and selected, which

ones they hired, and the decision-making process involved in the selection. The reflective inquiry approach trains participants in the skills of reflecting through asking questions and understanding the nature of problems and the issues associated with them (Gningue et al., 2014).

Conclusion

Little information is available on principal professional development and the screening and selection processes used by principals. Outside of the administration certification process, little else is done to provide meaningful professional development to principals (Hess & Kelly, 2005). Hess and Kelly (2005) found administrator preservice training was deficient in handling personnel. In their study of over 200 course syllabi from 31 university principal preparation programs, the researchers found university principal preparation programs were deficient in training future principals to examine data and personnel management (Hess & Kelly, 2005). Grissom and Harrington (2010) found mentoring and coaching impacted principal performance positively, while principal networking was found to have null or negative effects on improving principal effectiveness. The prototype screening simulation presented in the needs assessment gives credence to the fact that school leaders will create their own logic, rational or irrational, when they are not given information to help guide their thought processes. Principals need to develop criteria to assess candidates who fit their vision, the needs of the school, and what most affects student achievement (Mertz, 2010). Through knowledge and reflection, principals would be able to better improve their staff and positively affect student achievement.

Chapter IV

Intervention Procedure and Program Evaluation

This study was an investigation of the teacher credentials most associated with student achievement, and whether principals have that knowledge when screening and selecting candidates. The study focused on the decision-making processes of principals when hiring teacher candidates. Data were collected from the 25 high school principals in a school district located in the mid-Atlantic part of the United States. The intervention developed was based on the concept presented in Lewis's (2003) book *Moneyball: The Art of Winning*. The intervention, Educational Moneyball, provided an asynchronous online professional development program for the principals of the 11 high-poverty high schools in the school district. The program was conducted from June to August 2018. The 11 principals served as the treatment group, while the 14 principals not receiving the treatment served as the control/nontreatment group. This chapter includes the intervention methodology and design. The purpose of the study and proposed intervention was to provide the 11 principals of the high-poverty high schools with the knowledge and strategies needed to make informed decisions to screen and select effective teacher candidates.

Research Questions and Hypothesis

The following research questions guided the study:

RQ1: Did the online professional development impact the 11 high school principals and improve their knowledge on teacher credentials that impact student achievement?

RQ2: Did the online professional development impact the decision-making processes of the 11 high school principals in their screening and selecting of teacher candidates?

The researcher hypothesized the online professional development would positively impact principals' knowledge of teacher credentials that have a positive impact on student achievement, and improve their decision-making process when screening and selecting teacher candidates.

Methodology

The study is a quasi-experimental preintervention–postintervention design and utilized quantitative and qualitative data. The data were acquired before the professional development intervention and at the conclusion of the intervention. Surveys were sent to participants through a Google Forms attachment in an e-mail. The purpose of this chapter is to include a description of the intervention, context and participants, participant recruitment, instrumentation, intervention procedure, and data analysis.

Participant Recruitment

All 25 high school principals received an e-mail introducing the study. Also included in the e-mail was a recruitment letter (Appendix A), informed consent letter (Appendix B), and link to the principal preintervention survey (Appendix C). Over the first month of the study, five principals either retired or moved on to other positions as the 2017–2018 fiscal school year ended (June) and the 2018–2019 school year began (July). The five new principals also received the e-mail with the consent and recruitment letters and the survey attachment. Thirty principals representing the 25 high schools were recruited for this study. In the end, 17 principals participated in the study. Of the 17 participants, eight were from the 11 high-poverty high schools and nine were from the 14 low-poverty high schools.

Participants

The participants in the Educational Moneyball intervention were divided based on academic success of their respective schools, as determined by the district. The two groups were the 11 principals of the high-poverty high schools (treatment group) and the 14 principals of the low-poverty high schools (business as usual comparison group) because the low-poverty principals had a greater pool of applicants because of the reputations of their schools. High- and low-poverty schools are defined according to the percentage of students on FARMs. In the district, the schools designated as high-poverty have 50% or more of their students on FARMs (Bonner-Tompkins, 2014). The high-poverty principals have to be more careful and conscientious of whom they select and interview due to a limited pool of applicants willing to apply for positions at their schools. The purpose of the intervention was to provide tools to give the principals of the high-poverty schools an advantage when it comes to the screening and selection process. The separation of the two groups had already been set by Bonner-Tompkins (2014) in her report that identified the high-poverty and low-poverty schools based on their graduation rates, AP performance, SAT/ACT performance, and academic eligibility.

Table 4 presents the demographics of the participants. The sample was split roughly evenly between White and African American respondents as well as gender. The treatment group had more principals with 20 or more years of teaching experience, and the control group had more principals with AP experience, but the differences between the groups were not statistically significant. Both groups had more master's-level respondents than doctorate-level respondents. None of the demographic differences between treatment and control group was statistically significant.

Table 4

Demographics of the Participants

Category			Control	Treatment	Total
Total population		Count	9	8	17
		% within group-demo	100.0%	100.0%	100.0%
Ethnicity, %	White	Count	4	5	9
		% within group-demo	44.4%	62.5%	52.9%
	Black	Count	5	3	8
		% within group-demo	55.6%	37.5%	47.1%
Gender, %	Male	Count	5	5	10
		% within group-demo	55.6%	62.5%	58.8%
	Female	Count	4	3	7
		% within group-demo	44.4%	37.5%	41.2%
Principal EXP-demo	0-5	Count	1	2	3
		% within group-demo	11.1%	25.0%	17.6%
	6-10	Count	4	1	5
		% within group-demo	44.4%	12.5%	29.4%
	11-15	Count	2	2	4
		% within group-demo	22.2%	25.0%	23.5%
	15-20	Count	2	2	4
		% within group-demo	22.2%	25.0%	23.5%
	20	Count	0	1	1
		% within group-demo	0.0%	12.5%	5.9%
Degree	MA	Count	6	5	11
		% within group-demo	66.7%	62.5%	64.7%
	Doc	Count	3	3	6
		% within group-demo	33.3%	37.5%	35.3%

Instrumentation

Participants received a preintervention survey and postintervention survey during the course of the study. The preintervention survey was designed to gain demographic data, information on the screening and selection practices of principals in the district, and their decision making when hiring teachers based on the principals' past experiences. The preintervention survey consisted of 25 questions and was based on the survey done by Papa and Baxter (2008) in their study of the hiring practices of New York City principals. The

preintervention survey for this study consisted of 18 closed-ended (quantitative) questions and seven open-ended (qualitative) questions. The quantitative questions required principals to provide information on their demographics, career experiences, beliefs, and the teacher credentials (years of experience, advanced degrees, National Board certification, reputation of undergraduate school, level of certification, references/recommendations, Praxis II scores, and race and gender) on which they placed the most importance when screening and selecting teacher candidates. The questions were designed to be answered with yes/no, multiple-choice, or a 5-point Likert scale (see Appendices C and D).

The qualitative questions were intended to give respondents the opportunity to provide their thoughts and expand on their thinking and reasoning. These questions asked participants about the challenges they face during the screening and selection process, their screening strategies, and ways the screening and selection process can be improved at their schools and on the district level. Both the treatment group (8 principals of high-poverty high schools) and the control group (9 principals of low-poverty high schools) were expected to complete the preintervention survey. The researcher received an e-mail notification after each participant had completed the survey.

The postintervention survey was sent to the treatment group in an e-mail asking them to complete the survey only after completing both the professional development and a round of teacher candidate interviews. The postintervention survey was also sent to the control group in an e-mail asking them to complete the survey after they had completed a round of teacher candidate interviews. The postintervention survey consisted of 15 questions. Nine closed-ended questions asked participants to reflect on the candidates they interviewed and place, in order of importance on a 5-point Likert scale, the credentials they felt were *most important* to *not at all*

important. Six open-ended questions gave participants the opportunity to explain how they came to their screening and selecting decisions and how they, and the district, could have done better in the screening and selection process. The purpose of the postintervention survey was to see if the professional development the treatment group completed had an effect on their hiring and decision-making practices.

Procedure

This section provides a summary of the various parts two-month intervention created to provide professional development to principals of the high-poverty high schools of the district studied. The program was conducted from June to August 2018. The data collected from the preintervention survey were used to measure the change in perceptions of the treatment group before and after the intervention. Data on participants' hiring and decision-making processes were collected from the postintervention survey and their reflections from the screening and selection of new hires. The survey was designed to take 15–20 minutes to complete, and required participants to reflect on past screening and selection practices. The treatment group was sent the online intervention upon completion of the preintervention survey. The intervention was designed to take 30 minutes to complete, and provided information based on the findings from the literature review and needs assessment. The postintervention survey was given three weeks later, at the end of June. The postintervention survey was also sent through an e-mail explaining its purpose and the directions for proper completion. The surveys were administered through a Google Forms attachment in an e-mail explaining the purpose and directions for completing the survey.

Intervention

Table 5 provides an overview of the activities and a description of each part of the intervention. The logic model for the intervention can be found in Appendix E.

Table 5

Session Activities and Descriptions

Session activity	Description
Reflection inquiry: How is this conversation similar to ones you have had with your instructional leadership team or hiring committee? When it comes to the screening and selecting of teacher candidates, what is the problem with the process?	Participants view "What's the Problem?" scene from the film *Moneyball* (2011)
Presentation of information	Overview of the definitions of *screening* and *selection*
Presentation of information	Discussion of teacher credentials and the credentials that correlate with student achievement
Simulation-based training	Participants view the mock English teacher applicants' credentials and identify who they would select for an interview
Job-embedded training	Participants view PowToons video and use the attached administrative decision-making model worksheet to select a mock math teacher candidate
Conclusion	Review of the findings of the presentation

Reflection inquiry. The professional development opened with an overview of the *Moneyball* theory and how it relates to the screening and selection of teacher candidates. Participants were asked to watch a scene from the 2011 film *Moneyball* in which Billy Beane of the Oakland A's (played by Brad Pitt) and his leadership team discuss how they are going to replace two of their top players who left to play for better teams. The conversation revolves around what skills/credentials the team should be looking for in trying to replace their two star

players. Participants were asked to watch the video and reflect on whether the conversation in the scene was similar to conversations they have had with their own leadership teams when making hiring decisions. The questions participants were asked were, How is this conversation similar to ones you have had with your instructional leadership team or hiring committee? and When it comes to the screening and selecting of teacher candidates, what is the problem with the process?

Presentation of information. Participants were presented with information on teachers' impact on student achievement and then provided with the definitions of *screening* and *selection.* This information was presented to give participants an understanding of the importance of the screening and selection process and how a poor selection can have a negative impact on student achievement for years to come (Rose et al., 2014).

Participants were then presented with information from the literature review on the teacher credentials most associated with student achievement: (a) bachelor's degree from a highly competitive university (Clotfelter et al., 2010), (b) three to five years of experience (Goldhaber, 2007; Harris & Sass, 2009; Kersting et al., 2013), (c) standard state certification (Clotfelter et al., 2010), and (d) National Board certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007; Harris & Sass, 2009). An in-depth analysis was presented on each credential and the findings from the literature review.

Simulation-based training. Participants were then required to examine the mock English applicants who were originally presented in the needs assessment to the assistant principals and department chairs. Participants were asked to look at the applicants and reflect on who they would select and why they would make that selection. The results from the needs assessment were shared with the participants to highlight the differences and variety of reasons school leaders use to justify their choices. Following the review of mock applicants, participants

were provided with information explaining the need to change the screening and selection process and the possible benefits from having a process that can help increase the number of effective teachers at high-poverty, low-performing schools (Simon & Johnson, 2015).

Job-embedded training. Next, participants were introduced to the administrative decision-making (ADM) model (Mertz, 2010; Oetjen, Oetjen, & Rotarius, 2008). Participants were introduced to the six steps of the ADM: (a) identify the problem or need, (b) define and rank relevant criteria, (c) collect information, (d) formulate and rank solutions, (e) take action, and (f) monitor solutions.

A link was embedded in the presentation for the participants to watch a PowToons video that explained how the teacher candidate screening and selection process can be streamlined using the ADM. The first step is for the principal to identify the need, which would be to screen and select a new hire for the school. The second step is to look at the applicants and rank them based on the credentials they possess that are aligned with the credentials presented in the intervention. The third step is to look through the applicants and determine what the needs are and how they fit the school culture. The fourth step takes place during the interview process in which the principal interviews clients and then formulates a scoring process and ranks candidates based on the criteria previously determined in Step 2. During Step 5, the principal takes action by hiring the best candidate for the position. Finally, Step 6 requires the principal to observe, monitor, and evaluate the teacher over the course of the school year.

After the video, participants were directed back to the presentation and asked to take all they had learned and apply it to another table of mock applicants. Participants were given the table of mock math candidates that was also given to school leaders during the needs

assessments. Participants were asked to again select the applicant they would bring in for an interview.

Conclusion of intervention. The presentation concluded with a recap of the information presented in the intervention. Participants were reminded the research does not suggest they have to hire a teacher with a bachelor's degree from a competitive university, three to five years of experience, and National Board certification. However, the research shows one or any combination of these credentials will have a positive effect on student achievement.

The participants were asked to take what they learned and apply it to the actual screening and selection they were doing over the summer. Finally, participants were asked to complete the postintervention survey and share the positions they were looking to fill, the decision-making process they used to screen and select teacher candidates, and the credentials on which they placed the most importance.

Data Collection

Seventeen teachers completed the preintervention survey. The participants were coded from A to Q (17 letters) based on the order in which they completed the survey. The treatment group received the link to the online professional development after they completed the preintervention survey. They were given three weeks to complete the professional development. The control group was given the postintervention survey upon completion of the preintervention survey, and were told to complete it only after they had interviewed teacher candidates. Participants who had technical issues completing the surveys e-mailed the researcher and either completed the surveys over the phone or were sent hard copies of the surveys.

Data Analysis

Data were collected from participants' preintervention and postintervention surveys. The data were input into SPSS. Independent *t* tests were performed as well as Mann–Whitney *U* tests to compare principals' credential preferences before the intervention and following the intervention.

Data Summary Matrix

The data summary matrix (Table 6) shows the connections between the research questions, the instrumentation used, the data collected, and the data analysis.

Table 6

Data Collection Matrix

Fidelity indicator	Data source	Data collection tool	Frequency	Responsibility
Adherence	Program outline/ manual aligned to PGS standards	• Observation • Checklist of activities completed	During professional development program	• Evaluator • Staff development teacher
Participant responsiveness (engagement)	Participant attendance	e-mail notification of completion of the surveys	Before and after the completion of professional development program	Evaluator
Participant responsiveness (engagement)	• Mock application tracking system • Simulation-based training	Postintervention survey	During professional development program	• Evaluator • Staff development teacher
Participant responsiveness (engagement)	Presentation and modeling of the administrative decision-making model	Postintervention survey	During professional development program	• Evaluator • Staff development teacher
Participant responsiveness (engagement)	Participant feedback on the perception on the professional development	Postintervention survey	After completion of the professional development program	Evaluator

Evaluation

Data on teacher credential preferences, screening and selecting practices, and decision-making processes were collected through preintervention and postintervention surveys. Principals of the school district follow what is known as the PGS (MCPS, 2015a); this system is used to monitor and evaluate the performance of principals on the elementary and secondary levels. Made of up four performance standards, the PGS highlights the responsibilities and expectations of administrators. In relation to this study, the theory of treatment, incorporating research-based information with evidence-based decision making, can ultimately be aligned with Standard I which states, "The principal is an educational leader who promotes success for all students as he/she facilitates the development, articulation, implementation, and stewardship of a vision of teaching and learning that is shared and supported by the school community" (MCPS, 2015a, p. 15). Within this standard are four objectives for principals:

> [a] Identifies and provides human and material resources, based on the school's allocation, to achieve the school's vision of high standards for teaching and learning, [b] Uses inclusive practices in hiring, promoting, and providing leadership opportunities for students and staff of all races and ethnicities, [c] Collects, analyzes, and monitors student/staff performance data to adapt instructional/workplace practices to eliminate achievement/performance gaps, and [d] Creates consistent standards for the screening and selection process (MCPS, 2015a, p. 15)

Within this program, Objectives 3 and 4 of Standard I are aligned with the activities and measurements of the intervention.

To make sure data were collected with high fidelity, a checklist was used that aligned with the PGS, which is used to evaluate principals. From the data collection matrix, adherence for this program was measured by the evaluator and the staff development teacher who assisted with the development of the intervention. Adherence data were collected through the use of checklists by both parties throughout the intervention. The PGS served as the basis for the

checklist. The materials and activities of an intervention are selected by the developer at the beginning of the study and are based on theory processes (Nelson, Cordray, Hulleman, Darrow, & Sommer, 2012). From an adherence perspective, if these processes are not present as anticipated through development and delivery of the program, then the intervention could not be implemented as intended (Nelson et al., 2012).

Conclusion

The professional development program for this study was created based on the literature and was purposed for improving the foundational knowledge of high school principals in identifying the teacher credentials aligned with student achievement. The program also was created to provide the principals with a technique to improve their decision making when screening and selecting teacher candidates. This chapter included a discussion of the quasi-experimental design utilized to collect and evaluate the data based on the research questions; the participants and participant recruitment; and the intervention, data collection, and data analysis. The next chapter includes a discussion of the findings from the study.

Chapter V

Findings and Discussion

The purpose of this study was to examine the teacher credentials preferred by high school principals when screening and selecting teacher candidates and the decision-making processes that go into making those selections. The previous chapter presented the research design and components of the professional development created for the principals of the high-poverty high schools studied. This chapter is to present the findings of the study as they relate to the research questions, discuss the findings, evaluate the limitations of the study, and discuss the implications of the study. The intervention was guided by the following research questions:

RQ1: Did the professional development provide the principals of the high-poverty high schools with the evidence-based knowledge they need to identify the teacher credentials associated with student achievement when screening and selecting teacher candidates?

RQ2: Did the professional development improve the decision-making processes of principals of high-poverty high schools?

Process of Implementation

The study focused on the decision-making processes of high school principals when hiring teachers in a school district located in the mid-Atlantic part of the United States. The intervention developed was based on the concept presented in Lewis's (2003) book *Moneyball: The Art of Winning*. The intervention, Educational Moneyball, provided an asynchronous online professional development program for the principals of eight high-poverty high schools in the school district. The intervention focused on reflective inquiry, simulation-based training, and job-embedded training. The program was conducted from June to August 2018.

Findings

The first research question focused on whether the participants of the intervention gained the knowledge of the teacher credentials associated with student achievement. The data were gathered from nine principals of low-poverty, high-achieving schools (the control group) and eight principals from high-poverty, low-achieving schools (the treatment group). The survey was completed at two points in time. For the treatment group, the postintervention survey occurred after the professional development. Differences between the two groups were tested using Fisher's exact test (nominal) and the Mann–Whitney *U* test (ordinal). The survey questions asked respondents to rate the importance of different factors when hiring, all of which were measured on an ordinal scale. Preintervention (Time 1) and postintervention (Time 2) responses were summarized with medians and the interquartile range (25th and 75th percentiles, with the median being the 50th percentile). Mann–Whitney *U* tests were used to test for significant differences between groups at both survey administrations. Finally, change scores (Time 2 – Time 1) were summarized with means and standard deviations. Although the change scores took on a larger range than the original ordinal scales, the distribution of change scores were still nonnormal. Tests of group differences are therefore presented using both the independent-samples *t* test and the Mann–Whitney *U* tests. Figure 1 shows the preintervention survey responses by the treatment group. Prior to the intervention, the majority of the treatment group found references and letters of recommendation to be most important, and the race, gender, and ethnicity of the applicant to be moderately important.

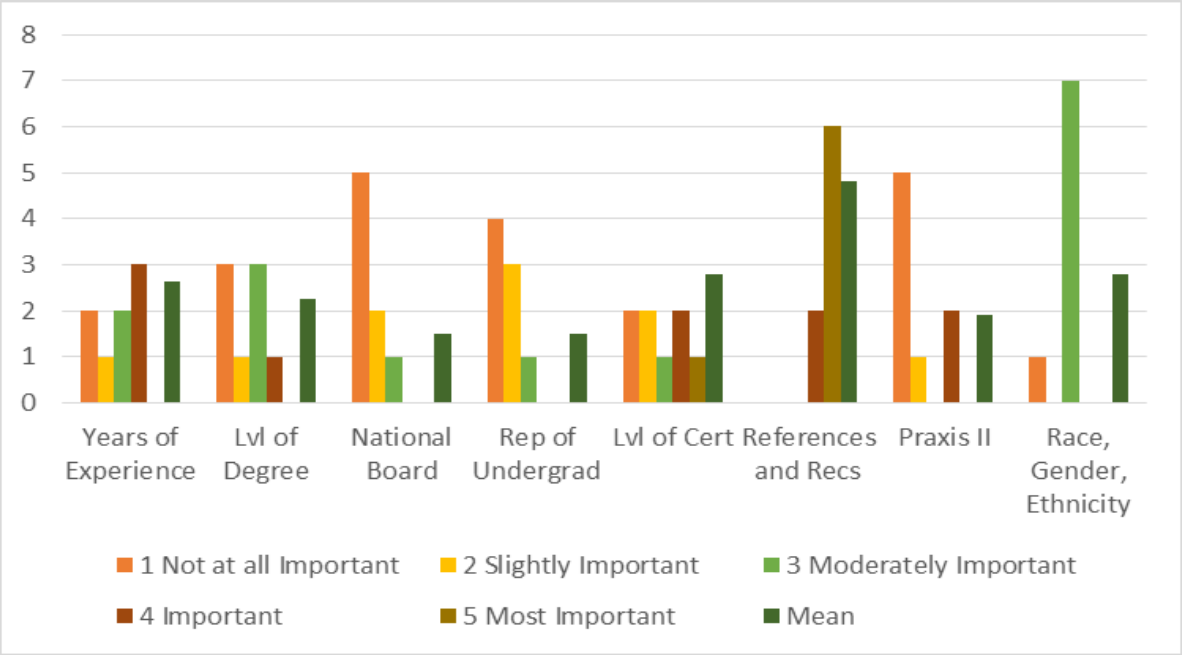

Figure 1. Treatment group preintervention results and means by question.

Figures 2 and 3 show the postintervention survey results and means by question for the treatment group and control group. Both of these figures show the importance that both groups place of references and letters of recommendation.

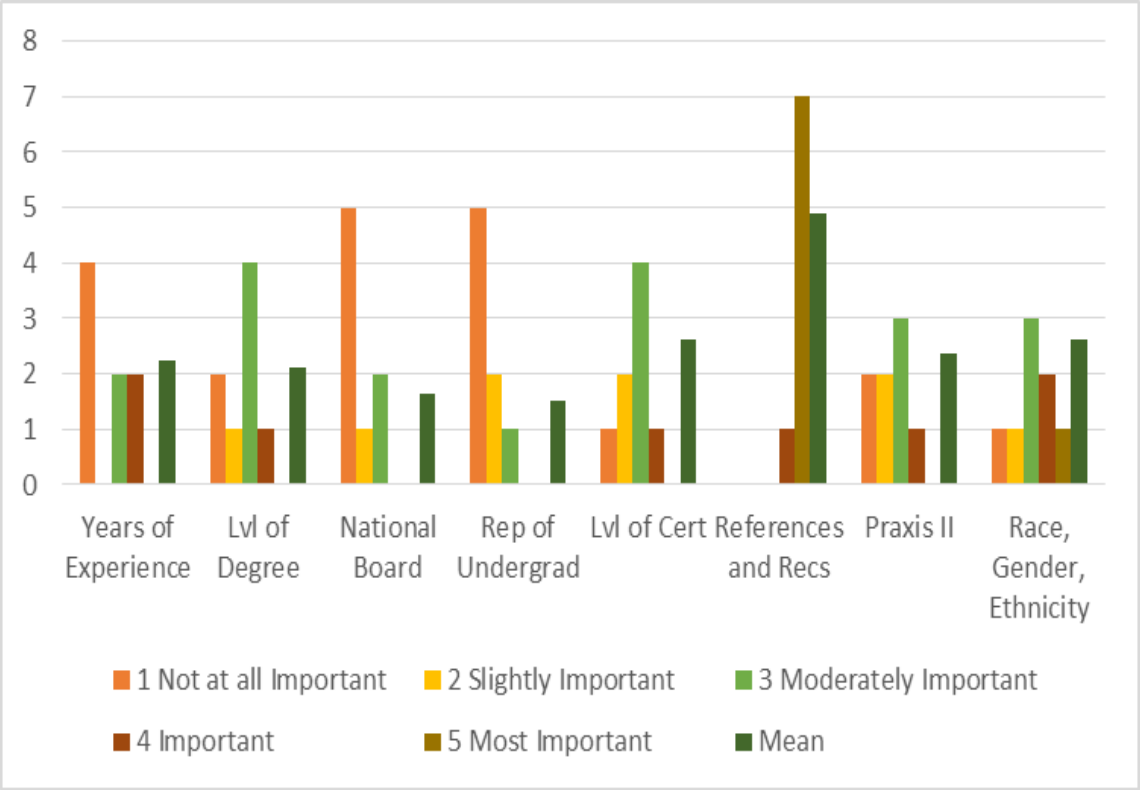

Figure 2. Treatment group postintervention results and means by question.

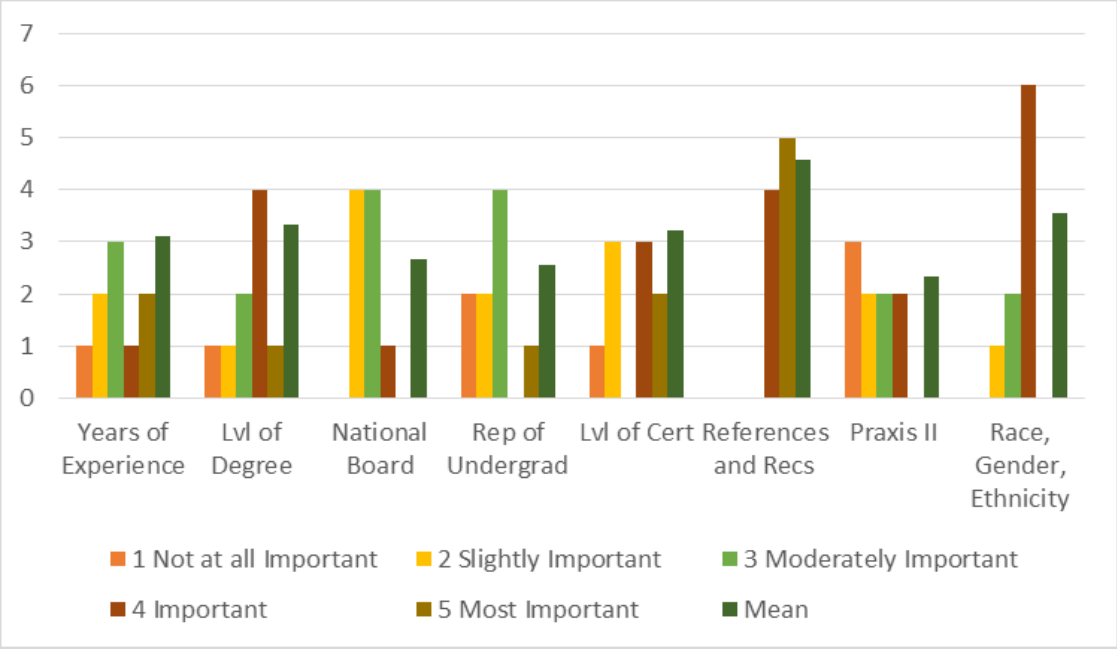

Figure 3. Control group postintervention results and means by question.

Table 7 presents group differences in change from preintervention to postintervention. The table presents the mean and standard deviations in change scores calculated as Time 2 minus Time 1, where negative values indicate a decrease in responses and positive values indicate an increase. Means and standard deviations are reported because the range of values was wider for difference scores than the original ordinal values, though it is worth noting the median change for all variables was zero in both groups. None of the difference scores was statistically significant between treatment and control groups, whether the parametric *t* test or nonparametric Mann–Whitney *U* test was used.

Table 7

Group Differences in Change From Preintervention Survey to Postintervention Survey

Credential	Group-demo	N	Mean	Std. deviation	Std. error mean
Level of experience change	Control	9	-.2222	1.85592	.61864
	Treatment	8	.1250	.35355	.12500
Degree change	Control	9	.5556	.72648	.24216
	Treatment	8	.1250	.99103	.35038
NBCT change	Control	9	.4444	1.01379	.33793
	Treatment	8	.1250	.64087	.22658
Undergrad rep change	Control	9	-.1111	1.05409	.35136
	Treatment	8	-.2500	.88641	.31339
Level of cert change	Control	9	.5556	1.01379	.33793
	Treatment	8	-.2500	.70711	.25000
Recs and refs change	Control	9	-.1111	.33333	.11111
	Treatment	8	.1250	.35355	.12500
Praxis score change	Control	9	-.1111	.78174	.26058
	Treatment	8	.3750	1.30247	.46049
Race or gender change	Control	9	.4444	.72648	.24216
	Treatment	8	.2500	1.16496	.41188

Table 8 provides the results from the independent *t* test and Levene's test for equality of variance for the treatment group and control group.

The purpose of the Educational Moneyball intervention was to provide the principals of the high-poverty, low-performing high schools with evidence-based data on the teacher credentials linked to student achievement: (a) bachelor's degree from a highly competitive university (Clotfelter et al., 2010), (b) three to five years of experience (Goldhaber, 2007; Harris & Sass, 2009; Kersting et al., 2013), (c) standard state certification (Clotfelter et al., 2010), and (d) National Board certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007; Harris & Sass, 2009). In the intervention, participants were given background on the credentials and the studies that support the claims. Participants were also given training on how to use the six-step ADM model in order to make sound hiring decisions.

In the preintervention and postintervention surveys, when selecting the credentials that are considered in the hiring process, the researcher added Praxis II exam, references/recommendation, and gender and ethnicity as choices because they were mentioned by participants during the needs assessment, in other studies (Goldhaber, 2007; Mason & Schroeder, 2014), and in the researcher's experiences of sitting in on interviews and in hiring committees.

Years of Experience

Using an alpha level of .05, an independent-samples *t* test was conducted to evaluate whether the treatment group and control group made different selection decisions during the screening and hiring process. The importance of years of experiences was not significant, $t(14.697) = 1.287$, $p > .05$, $d = .62$.

Table 8

Independent-Samples Test

Credential		Levene's test for equality of variances		*t* test for equality of means						
								Std. error diff.		95% confidence interval of the diff.
		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean diff.	Lower	Upper	
EXP-post	Equal variances assumed	.464	.506	1.288	15.000	.217	.861	.668	-.564	2.286
	Equal variances not assumed			1.287	14.697	.218	.861	.669	-.568	2.290
Level of degree-post	Equal variances assumed	.089	.770	1.485	15.000	.158	.833	.561	-.363	2.029
	Equal variances not assumed			1.498	14.998	.155	.833	.556	-.353	2.019
NBCT-post	Equal variances assumed	1.234	.284	2.642	15.000	.018	1.042	.394	.201	1.882
	Equal variances not assumed			2.600	13.150	.022	1.042	.401	.177	1.906
Rep of undergrad-post	Equal variances assumed	1.205	.290	2.089	15.000	.054	1.056	.505	-.022	2.133
	Equal variances not assumed			2.149	13.431	.050	1.056	.491	-.002	2.113
Level of cert-post	Equal variances assumed	5.690	.031	.983	15.000	.341	.597	.607	-.697	1.892
	Equal variances not assumed			1.011	13.507	.330	.597	.591	-.674	1.868
Praxis score-post	Equal variances assumed	.410	.532	-.074	15.000	.942	-.042	.559	-1.234	1.151
	Equal variances not assumed			-.075	14.995	.941	-.042	.554	-1.223	1.140
Race or gender-post	Equal variances assumed	1.165	.298	.883	15.000	.391	.431	.487	-.608	1.470
	Equal variances not assumed			.856	10.989	.410	.431	.503	-.676	1.537
Recs and refs-post	Equal variances assumed	9.251	.008	-1.447	15.000	.169	-.319	.221	-.790	.151
	Equal variances not assumed			-1.482	14.038	.161	-.319	.216	-.782	.143

The examination of the group means for the treatment group ($M = 2.25$, $SD = 1.389$) indicates the control group ($M = 3.11$, $SD = 1.364$) thought years of experience was *moderately important*, while the control group on average felt experience was only *somewhat important*. Prior to the intervention, the treatment group was at ($M = 2.63$, $SD = 1.188$), while the control group was at ($M = 2.78$, $SD = 1.202$).

Advanced Degrees

The importance of advanced degrees was not significant, $t(14.998) = 1.498$, $p > .05$, $d = .72$. The examination of the group means for the treatment group ($M = 2.50$, $SD = 1.069$) indicated the control group ($M = 3.33$, $SD = 1.225$) placed more emphasis on whether a candidate has a master's degree or doctorate. Prior to the intervention, the treatment group was at ($M = 2.25$, $SD = 1.165$), while the control group was at ($M = 2.89$, $SD = 1.167$).

National Board Certification

There were no significant differences in principals wanting to hire teachers who were National Board-certified, $t(13.150) = 2.600$, $p > .05$, $d = 1.271$. Prior to the intervention, treatment group scores were ($M = 1.50$, $SD = .756$), while control group scores were ($M = 2.22$, $SD = .667$). In the postintervention survey, the treatment group scores were ($M = 1.63$, $SD = .916$), while the control group scores were ($M = 2.67$, $SD = .707$).

Reputation of Undergraduate School

There were no significant differences in principals wanting to hire teachers based on the reputation of the undergraduate school they attended. For the treatment group, the scores were $t(13.431) = 2.149$, $p > .05$, $d = 1.034$. Before the intervention, the treatment group scored ($M = 1.63$, $SD = .744$), while the control group scored ($M = 2.78$, $SD = 1.302$). After the intervention,

the treatment group scored (M = 1.50, SD = .756), while the control group scored (M = 2.56, SD = 1.236).

Level of Certification

The level of certification a teacher possesses showed some significance in the study, $t(15) = .983$, $p < .05$, $d = 0.479$. The preintervention survey data showed (M = 2.75, SD = 1.488) for the treatment group and (M = 2.78, SD = 1.202) for the control group. In the postintervention survey, the data for the treatment group indicated (M = 2.63, SD = .916), while the data for the control group indicated (M = 3.22, SD = 1.481).

Recommendations and References

While not showing significance, of all of the credentials, the use of recommendations and references was important to principals in the screening and selection process, $t(15) = -1.447$, $p < .05$, $d = 0.712$. On the preintervention survey, both groups showed high preference for using these tools in their decision making. The treatment group scored (M = 4.75, SD = .463) and the control group scored (M = 4.67, SD = .500). In the postintervention, the treatment group scored (M = 4.88, SD = .354) and the control group scored (M = 4.56, SD = .527).

Praxis II Scores

Praxis II scores, which are an indicator of a teacher's content knowledge, was another credential that proved to be unimportant to principals when hiring teachers, and not statistically significant, $t(14.995) = -.075$, $p > .05$, $d = 0.436$. In the postintervention survey, the treatment group data indicated (M = 2.38, SD = 1.061) and the control group data indicated (M = 2.33, SD = 1.225). Principals' use of the Praxis II exam as a factor in the screening process increased for the treatment group from the preintervention survey (M = 1.98, SD = 1.414). The control group's numbers did not change significantly from the preintervention survey (M = 2.44, SD = 1.236).

While it may not have been a factor before they had to interview candidates, the Praxis II scores may have taken on more significance when principals were attempting to ensure they were hiring teachers who knew the subjects they were being hired to teach.

Race, Gender, and Ethnicity

Finally, although it can play a factor in the hiring process, principals were asked to share how important it was to hire based on diversity. Principals' efforts to create diverse staffs for their schools proved not to be statistically significant, $t(10.989) = .856$, $p > .05$, $d = 0.421$. In the preintervention survey, the control group scored ($M = 3.22$, $SD = .833$), while the treatment group scored ($M = 2.75$, $SD = .707$). In the postintervention survey, the treatment group scored ($M = 3.13$, $SD = 1.246$), while the control group scored ($M = 3.56$, $SD = .726$).

Open-Ended (Qualitative) Questions

The researcher examined the open-ended questions from both surveys in order to answer the second research question, Did the professional development improve the decision-making processes of principals of high-poverty high schools? and to examine the thought processes of the control group, who usually have a large applicant pool from which to choose and therefore do not have to be as strategic in their screening and selection process as the treatment group. Through the use of coding, the researcher read through the data and found the themes and subcategories that emerged (Creswell & Clark, 2011).

Preintervention Survey

Preintervention Survey Question 1 asked, In your opinion, what qualities make for an effective teacher? Both the treatment group and the control group mentioned the qualities of effective teachers are knowing their content and how to teach that content. Participants also

mentioned the importance of teachers building good relationships with students. One of the control group principals stated,

> First and foremost, a teacher is effective based on the results he or she achieves in terms of student mastery of the content/curriculum. However, effective teachers must also build relationships with students, believe in the ability of every student to be successful, create a positive classroom environment, collaborate with colleagues, and demonstrate a commitment to professional growth, reflection, and professionalism.

Another one of the control group principals stated,

> [An effective teacher] possesses a commitment to equity and access for all students; builds excellent relationships with all students—even those with a different background than his/her own; possesses high expectations for all students; knowledge of content; knowledge of how to teach the content to students & knowledge of the steps to take to unscramble students' confusion; possesses knowledge of a variety of assessment and feedback strategies; possesses a sense of efficacy—that the teacher believes in his or her own ability to increase learning for all students.

Neither group mentioned the credentials presented in the study (bachelor's degree from a highly competitive university, three to five years of teaching experience, standard state certification, National Board certification), but instead focused on the intangibles that are not quantifiable. While classroom observations can help in identifying these intangibles, they are hard to objectively measure and may be open to bias.

Preintervention Survey Question 2 asked, How does your district screen and select potential hires? Participants in both groups described a centralized hiring system in the district from which the OHRD has to rely on out-of-state recruitment due to low enrollment numbers in the in-state teacher preparation programs. A treatment group principal listed the entire recruiting process:

> [a] Candidate completes district application, [b] Candidate is interviewed by HR, [c] Candidate is permitted to apply for vacant positions, [d] Schools interested in candidate schedules candidate for interview, [e] Candidate is ranked according to interview team/school, [f] School informs candidate of their interest to hire, [g] School contacts HR and recommends candidates for hire, [h] HR informs candidate of school's desire, [i] Candidate accepts/rejects offer.

This process shows a majority of the screening being done by the HR office. The schools have the most control of the process when they use the ATS to call candidates for interviews, the interview process, and the ranking process of candidates.

Another treatment group principal shared some of his frustrations with the screening and selection process when having to deal with involuntary transfers:

> There is an HR screening interview prior to candidates being allowed to interview at schools. My challenges are rarely with new hires though. There is not a system in place to help principals effectively screen out ineffective teachers before transfer interviews. Sadly, we cannot always rely on our colleagues to tell us the whole story about their staff . . . leaving us to guess whether we asked "the right questions" in our reference checks.

In their answers on both the preintervention and postintervention surveys, principals in both groups indicated references and recommendations were either *very important* or the *most important* factors they considered when selecting teacher candidates.

Preintervention Survey Question 3 asked, What decision-making strategies do you use at your school to screen effective teachers for interviews? Of the 17 participants, 65% stated reviewing recommendations and references was a major factor in helping them make final hiring decisions. Others mentioned the importance of how the candidate comes across in the interview and whether he or she is a good fit. A control group principal stated,

> We use standard questions when interviewing candidates. Those questions reflect the needs and priorities of the school. We also ensure that a variety of stakeholders are involved in the interview process. Prior to interviewing candidates, we also agree on what we are looking for in an ideal candidate. Finally, we always check references.

Another control group principal stated,

> We have designed interview questions that align with the school vision that all students access the rigorous instruction of our International Baccalaureate World School. In addition to including questions about lesson design/student assessment, teacher expectations, we also include questions about building relationships with students, building collaborative working relationships with staff (in PLCs) [professional learning communities], using data in instructional planning and we ask the candidates what type of working environment helps them do their best.

The answers from the group suggested that once candidates come in to be interviewed, they have to "sell" themselves and align with the vision and culture of the school.

Preintervention Survey Question 4 asked, What are some challenges that you face during the process of screening and selecting teacher candidates? All of the treatment group participants mentioned the frustration of not being able to find enough diverse candidates, especially males and minorities. The treatment group principals oversee schools with high-minority populations. They stated it is hard finding teachers who look like their students. In response to the question, one treatment group principal stated,

> Getting quality candidates to walk through the door, especially experienced good teachers. Schools that are more challenged need teachers who are ready and willing to work with all students, sometimes this is not the case with your best veteran teachers and new teachers are not always knowledgeable of what it will really take to teach in a challenged school.

Another treatment group principal mentioned problems with candidate references: "Gathering required references, and references being honest. Trying to keep up with all of the applicants, sorting through applicants." Again, principals highlighted the importance of references, but this particular principal realized candidates may inflate their accomplishments. These answers show that principals are trying to find criteria to make the best hiring decisions possible by relying on references, for lack of other viable alternatives.

Control group principals also expressed frustrations with applicants not being qualified and applicants who did not reflect the diversity of the students in their schools. One control group principal stated,

> Teachers might not possess the level of content knowledge needed to teach a high school/college level course; if the teachers possess the content knowledge, he or she might not possess pedagogical content knowledge—the ability to teach the material in a clear, coherent way to teenagers; some candidates do not possess a belief that all students can learn & they come to this low poverty school with the expectation that they will not need to teach many Black/Latino students; sometimes they come to the school making

> assumptions that all Black/Latino students are poor; surrounding districts also pay first-year teachers more, so I have lost excellent candidates to other school districts due to the pay.

An interesting observation shared by some of the control group principals was competition from other schools. In the school district studied, the majority of the low-poverty, high-performing schools are clustered in the northern part of the district, which could explain this particular principal's feeling that these schools have to compete with each other to hire the best candidates, but not with the high-poverty, low-performing schools.

Another challenge mentioned by the control group was not being able to observe teachers teaching prior to hiring them. One control group principal stated,

> Some challenges include the availability of viable candidates at a specific time during the process, if the applicant has been screened by HR prior to interviewing with the school, and the timing of interviews. I would like more opportunities to see candidates teach prior to hiring them but often we are hiring in the summer time.

As with sports, a coach/scout cannot truly evaluate a player without first watching him or her play. With small hiring windows and a lot of candidates to screen, principals do not have the time or resources to observe every candidate teaching. The lack of time available to spend on screening candidates explains principals' preferences for using references from candidates' previous supervisors who have seen the candidates teach.

Postintervention Survey

The treatment group completed a 30-minute professional development in which they learned the credentials related to student achievement and how to make better decisions when hiring teacher candidates. After completing the intervention, the treatment group was asked to use what they learned from the presentation and incorporate that knowledge into the screening and selection process of teacher candidates for their schools. Both groups answered the following postintervention survey questions.

Postintervention Survey Question 1 asked, What decision-making strategies did you use to screen for effective teachers for interviews? Only one treatment group principal mentioned using the ADM model to help in the decision-making process. Three of the treatment group principals stated they read through the recommendations and references. Three treatment group principals mentioned conferring with their leadership team/hiring committee to come to a consensus on which candidate was the most impressive during the interview process. These responses show the treatment group principals did not use the ADM in their decision-making process, but fell back to the status quo processes they were comfortable using.

In the control group, which did not participate in the intervention, 78% of the principals stated they used recommendations from the HR screening process and references. Two principals mentioned conferring with their leadership team/hiring committee. Three principals mentioned placing emphasis on the interview process.

Postintervention Survey Question 2 asked, How can your school more effectively screen and select teacher candidates? Two treatment group principals mentioned calling references. Three others mentioned relying on their hiring committee to have more of a voice in the hiring process. Three principals mentioned it would be more effective if they had additional information before the interview (e.g., race, gender, types of schools at which the candidates worked, languages spoken).

Three control group principals mentioned relying more on references and using the screening information from HR. Three other principals mentioned having teachers teach sample lessons. One principal mentioned it would help to have more time for interviews.

Based on the hiring process in the district being highly centralized, Postintervention Survey Question 3 asked, How can your district more effectively screen and select teacher

candidates? One treatment group participant stated, “The district needs to create an online system to automatically screen out candidates who do not meet hiring criteria or who have already accepted a position.” Three treatment group participants mentioned creating a system that would attract more diverse candidates. Two treatment group participants stated the district should create “stronger partnerships with teaching prep programs” and should “offer more student teacher opportunities.” Another participant in the treatment group suggested finding ways to attract second-career teachers and paying them competitive salaries.

Control group principals asked that the district “make sure that applicants are qualified for the position.” Another control group participant stated the district should “start the hiring process earlier in the school year and recruit widely across the country, and include principals in the process.” Three control group principals mentioned the district should have teacher candidates’ teaching be observed as part of the screening process. Finally, one of the principals in the control group recommended the district provide bonuses for teachers in hard-to-staff content areas.

Postintervention Survey Question 4 asked, What were the credentials of the most qualified candidate that you interviewed for a position? Based on the research, and having completed the intervention, treatment group principals were expected to provide answers that align with the following: (a) bachelor’s degree from a highly competitive university (Clotfelter et al., 2010), (b) three to five years of experience (Goldhaber, 2007; Harris & Sass, 2009; Kersting et al., 2013), (c) standard state certification (Clotfelter et al., 2010), and (d) National Board certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007; Harris & Sass, 2009). The answers the control group provided were expected to range across the spectrum of credentials.

In the treatment group, 63% of the participants stated they sought teacher candidates with a master's degree or doctorate. Three participants stated they sought candidates who had leadership experience. One candidate stated teachers' knowledge of content and pedagogy is important. Treatment group participants also mentioned the importance of candidates who are bilingual. Only one participant mentioned National Board certification and training from a competitive teacher prep program. These data show the intervention was ineffective and that principals would fall back on their experiences and gut instincts.

Four control group principals mentioned recommendations/references. Five stated they selected candidates with a master's degree or doctorate. Three mentioned they found candidates who had certification in their content areas. Four principals mentioned years of experience as being a factor, and one principal mentioned National Board certification. One principal stated a candidate brought a portfolio to the interview, which was a factor in the candidate getting hired. These responses proved the hypothesis that the answers from the control group principals would vary.

Postintervention Survey Question 5 asked, What were the credentials of the least qualified candidate that you interviewed for a position? Participants in the treatment group mentioned interviewing candidates who were not certified in the content area. Three of the treatment group members passed on candidates because they did not have advanced degrees. Another principal in the treatment group passed on a candidate because he had negative references and recommendations.

Principals in the control group also mentioned poor references and recommendations as being a factor in not hiring teacher candidates. One participant in the control group mentioned a candidate who received low marks in the HR interview. Three control group principals

mentioned candidates who performed poorly at the school-based interview. Three control group participants stated they did not select some candidates because they did not have enough teaching experience. One participant in the control group stated a candidate was not hired because he or she was not certified in the content area. Finally, three control group participants stated they passed on candidates who did not have advanced degrees.

Discussion

The aim of this study was to examine the teacher credentials that principals of high-poverty, low-performing high schools hold in high regard when screening and selecting teacher candidates. In this study four main questions were explored:

RQ1: What teacher credentials have a positive effect on student achievement?

RQ2: To what extent are the credentials of teachers at high-poverty high schools different from those at low-poverty high schools?

RQ3: What credentials do principals look for when screening and selecting effective teachers, and what is their decision-making process?

RQ4: To what degree are principals involved in the screening and selection process?

The goal of the study was to identify the credentials principals already use to screen and select candidates, to get an understanding of how they come to those decisions, and why they find some credentials to be more valuable than others. Principals in the treatment group were to take the information and knowledge gained from the intervention and use it during their summer hiring. The literature review revealed four teacher credentials that are most associated with student achievement: (a) a bachelor's degree from a highly competitive university (Clotfelter et al., 2010), (b) three to five years of experience (Goldhaber, 2007; Harris & Sass, 2009; Kersting et al., 2013), (c) standard state certification (Clotfelter et al., 2010), and (d) National Board

certification (Clotfelter et al., 2010; Goldhaber & Anthony, 2007; Harris & Sass, 2009). The treatment group, after completing the professional development, indicated those credentials were only *slightly* to *moderately important.* The results suggest principals will continue to make information-poor and ineffective hiring decisions based on several factors.

The statistical analysis of the quantitative responses showed no significant findings. The qualitative responses also showed the professional development did not change the hiring decision-making processes of those who need it most: the principals of the high-poverty, low-performing high schools in the district. These principals continued to rely on their instincts and prior experiences, and what they believed would be a good fit for their schools. However, in analyzing the responses of the participants, several themes emerged.

The timing of the hiring season may have played a factor in the decisions made by the principals during this study. Hiring during the summer (July–August) is more stressful as principals are under pressure to fill positions before the start of the new school year (Jabbar, 2018). Principals do not have time to be as particular and strategic as they would if they were screening and selecting teacher candidates during the spring hiring season (April–May). While the late hiring season may not lead to the hiring of less qualified teacher candidates, the later those candidates are hired, they more behind and ineffective they are due to lack of prep time before the start of the school year (Engel, 2012; Papay & Kraft, 2016). The need to quickly fill positions before the start of the school year could have been a factor in principals going with what they know from experience, and hiring who they felt was the most qualified candidate at the time. By July and August, principals have only a few weeks to fill out their teaching staff before the start of the new school year. As one participant mentioned, the hiring process should start earlier in the school year and principals should be more involved in the screening process.

Another factor that would allow principals more time screening and selecting teacher candidates would be if the district changed some of its hiring policies. Currently, schools have to accept teachers who are involuntarily transferred from one school to another within the district. Usually these teachers have received unsatisfactory evaluations or proved to be a poor fit for that particular school. If a position opens at a school in which a teacher has left or retired, then the district would involuntarily place that teacher at that school. The teachers being involuntarily transferred are guaranteed a position and given priority ahead of any candidates outside of the district. This forces principals to quickly fill the open position or be forced to take the transfer. This is a practice usually found at the low-performing, high-poverty schools that are in constant flux due to high teacher turnover.

Returning to the baseball metaphor on which this study is based, in order for a scout to determine if a player is talented, he has to see the player play, or at least rely on what other scouts have said about the player. The study showed, for both the high-poverty and low-poverty schools, references and recommendations are an integral part of the screening and selection process for high school principals in the district. The reliance on references and recommendations seems to be an easy solution when deciding who to hire, but in actuality, references and recommendations have some serious drawbacks. Unless the principal trusts the reputation and reliability of the writer of the recommendation, there are no guarantees the recommendation will ensure the candidate will be successful in positively impacting student achievement. While references and letters of recommendation may have helped to get candidates in the district hired, they are not predictive of how the teachers will perform during their first year on the job (Mason & Schroeder, 2014). The problem with letters of reference and recommendations are they are mostly positive (Mason & Schroeder, 2014), and a candidate

would not ask someone to serve as a reference if he or she knew it would be negative. Therefore, the inflationary nature of references and recommendations serve no other purpose other than to fit an antiquated criteria when submitting job applications. If principals truly want to have an idea of the skills the candidate possesses before hiring, it would be more productive, if time permitted, to view the candidate teaching, whether through the submission of a taped lesson or through a mock lesson presented during the interview. The misguided reliance on letters of recommendation and references serves as another example of how important it is for principals to have research-based knowledge before making hiring decisions.

When asked how high-poverty, low-performing schools could attract effective teachers, both groups mentioned pay incentives. Other suggestions from the treatment group included giving teachers more planning and professional development time. Several participants mentioned building the reputation of the school in the community and district: "communicate frequently with candidates, word of mouth, proactively reach out to possible candidates." One principal suggested "selling" the school by placing students on the hiring committee: "highlight successes, put the kids (who are usually awesome) on the interview panel (they sell the school better than any adult could), consider differential pay for a term commitment." In a suggestion that would fall under retaining effective teachers, one principal stated, "Have a supportive school admin team. Creating a 'family-like' environment amongst staff."

On the postintervention survey asking whether they were familiar with the ADM model, nine of the principals said "yes" (4 in the treatment group, 5 in the control group), while eight said "no" (4 in the treatment group, 4 in the control group). However, only one principal used the ADM after receiving training on how to use it. In answering the question, Do you think principals would benefit from professional development on how to screen and select teacher

candidates? 82% of principals said “yes”; yet it seems the treatment group incorporated what they learned when they had the opportunity to do so. As Wolfe et al. (2006) explained, institutions such as education institutions, which are bound by tradition, fall back on stagnant processes that reinforce the status quo. Enriquez-De-La-O (2015) stated gut decisions are shaped by previous experiences, and those experiences create patterns and rules that are constantly applied to one’s decision making.

Synthesizing the responses of the treatment group principals, they used the following factors to screen and select teacher candidates:

- references and recommendations,
- diversity (males and minorities),
- advanced degrees,
- Praxis II scores, and
- observation of teacher.

While previous studies showed three to five years of experience was a factor, 63% of the treatment group participants in the postintervention survey stated experience “did not matter,” while 67% of the control group participants selected candidates with one to five years of experience.

The results of the study also showed little difference in the hiring practices between principals in high-poverty high schools and principals in low-poverty high schools. Young and Miller-Smith (2006) asserted there is a difference in hiring between high- and low-performing schools. The fact there was not a difference in hiring practices between the high-poverty school principals and low-poverty school principals in this study suggests it might not be because of the decision-making processes of the principals but because one type of school (low-poverty, high-

performing) attracts a better pool of teachers than the other (high-poverty, low-performing). Digging deeper, it would seem one 30-minute professional development was not enough to address the isomorphism that exists in public education. The qualitative responses of the treatment group showed a resistance to moving away from conventional wisdom. Meyer and Rowan (1977) noted three consequences that arise when organizations and their actors are resistant to change: (a) they incorporate elements that are legitimated externally, rather than in terms of efficiency; (b) they employ external or ceremonial assessment criteria to define the value structural elements; and (c) they show dependence on externally fixed institutions reduces turbulence and maintains stability (pp. 348–349). The responses of the treatment group principals show a reliance on conventional wisdom in screening and selecting teacher candidates. As shown from the data, the treatment group did not use the ADM to work through the criteria for screening and selecting candidates. They brought in a number of candidates for interviews who, in some cases, they said were unqualified or uncertified. Despite the information shared from the intervention that advanced degrees have little to no effect on student achievement, 63% of the treatment group stated they sought teacher candidates with a master's degree or doctorate. In the analysis of why the principals in the treatment group may have resisted counterwisdom, Meyer and Rowan (1977) stated, "Institutionalized organizations must not only conform to myths, but must also maintain the appearance that the myths actually work" (p. 356). Even with the information proving otherwise, these principals went with the accepted norms and the myth that teachers with advanced degrees have better classroom success than those without advanced degrees. In trying to compete with the low-poverty high-performing high schools for teacher candidates, the treatment group principals think they have to find and attract the same type of candidates the control group principals are hiring. To end this cycle, it will take one principal

from the treatment group, much like Billy Beane and the Oakland A's, to take a chance and go against the conventional wisdom. Once an organization is willing to be innovative, and the innovation shows success, they will look at it as either a groundbreaker or an anomaly (DiMaggio & Powell, 1983). At this juncture, it does not seem any of the treatment group principals are willing to take that chance.

Strengths and Limitations

Little research has been done on the differences in screening and selecting of teacher candidates, and the decision-making processes between principals at high-poverty and low-poverty high schools. A strength of this study is it adds to the research on teacher credentials and principal hiring practices. This study also brings attention to the need for principal preservice and in-service training on hiring practices and administrative decision making. Finally, this study brings attention to the need for a uniform way for principals to quantify teacher credentials. With years of experience and advanced degrees not being factors linked to student achievement, the credentials mentioned as factors (NBCT, competitive teacher prep programs) should be coupled with those the principals mentioned but are intangible (knowledge, student relationships, caring) in order to better measure and improve teacher effectiveness.

Unlike *Moneyball*, in which it became widely accepted that certain credentials lead to team success, education still lacks consensus on what makes a teacher effective. The studies mentioned in the literature review revealed specific credentials had positive effects on student achievement. Each of those studies' researchers was able to gain access to students' grades and assessments scores. The achievement data they gathered gave the researchers the ability to match those variables to the teachers and their credentials. A limitation of this study was the district being studied would not allow the researcher to have access to student data.

Another limitation was the conclusions made in this study were drawn from a small population of high school principals ($N = 25$). In the power analysis for this intervention, the researcher used effect sizes of .2, .8, and .5, while maintaining a fixed alpha level (.05) and keeping the power level at .80. Out of that population of 25 was an even smaller sample size ($n = 17$). The participation and expected return rates for the measurement tools were too low for the treatment group ($N = 8$) and the control group ($N = 9$). The small sample size limited the reliability and generalizability of the study results. While the stakes might be higher for high school principals, the screening and selection of teachers in middle school, and even elementary school, may have provided deeper insight of the hiring process across the district and provided a bigger sample size (40 middle schools, 134 elementary schools). Their inclusion in this study could have also addressed if there are different definitions of *effective teacher* among different grade levels, and different credentials that are valued by middle and elementary schools.

The construction of the intervention was also limited. It may have been hard for principals to respond openly and honestly about their beliefs and practices. In answering the open-ended questions on both the preintervention and postintervention surveys, it seemed the control group principals were more forthcoming in answering and providing more detail and explanations to their answers. Test bias as a threat to internal validity addresses how exposure to a test can influence the participants' exposures to the test in the future. The preintervention survey questions for this study asked participants to explain and identify how and why they screen and select particular teacher candidates. If the preintervention survey is not sound, participants may answer questions in a manner that anticipates safe answers or provide responses they believe the researcher wants them to submit. It is also important that the instrumentation addresses how a measure may change over time. The hope is that change in behavior of the

participants will be the result of the intervention and not the pre- and postintervention surveys. Once participants complete the preintervention survey and the program, the postintervention survey needs to measure whether there has been a change, without administering a test similar to the preintervention survey. These possible threats to validity were anticipated prior to implementation of this study.

An important factor needed to further this study, would be to analyze the end-of-year evaluations of those teachers who were hired. Once the teachers are hired, they are evaluated by their principals over the course of the school year. The evaluation data collected at the end of the school year would be important toward examining the credentials of those teachers who met standard and those who were below standard. Data could then be collected to revisit whether the credentials and criteria on which they were hired had any correlation to student achievement and value added to the school.

Finally, the treatment group principals were allowed professional development on their own at their own pace, but it may have been more effective had the researcher presented the professional development in person to that group. This in-person presentation would have allowed for an open discussion on the screening and selection process and provided clarity and context in real time. The treatment group could have gone through each module with the guidance of the facilitator and participated in rich discussions and clarifying questions that could have helped in understanding why certain credentials have been proven to be more effective than others. The in-person presentation also would have given the researcher more insight and context into why most of the principals were so tied to their old screening and selection habits.

Recommendations

Based on the information gained from this study, the following recommendations would be made to the district and principals:

1. The district needs to create a database system that provides information on the links between teachers and student achievement (student eligibility, achievement tests, AP scores, IB scores).
2. The district should create a tool that screens for the best candidates based on the baseline data that identify those who are highly credentialed.
3. Like in sports, the schools with the most need for effective teachers should have first pick of the best teachers available in the applicant pool.
4. Policymakers should change the salary structure to address those credentials that actually affect student achievement, and provide extra incentives to attract more qualified teachers to high-poverty schools.
5. Teacher preparation and professional development should focus on the credentials that lead to higher student achievement.
6. Principal certification programs should focus on identifying effective teachers, screening and selection, and human capital management.

Conclusion

Since the *Coleman Report* over 50 years ago, efforts have been made to identify the teacher credentials that lead to student achievement. Even though the Educational Moneyball professional development did not create the desired results, this study proved there are major flaws in the screening, selecting, and hiring process used by the district studied. While all new teachers are not ineffective, and not all experienced teachers are effective, or have a master's

degree or doctorate, the intent of this study was to provide principals with data on the credentials that correlate with student achievement. The literature review revealed four credentials that are associated with student achievement. This study proved the high school principals in the district do not know the credentials that are associated with student achievement. The principals in the district also do not have a consistent decision-making process to help them screen and select teacher candidates effectively and with efficiency.

It will take policy changes at the district level by the superintendent to really address human capital management. It seems if it is not implemented at a policy level, principals will continue to screen, select, and hire candidates the way they see fit. While the district screens candidates to make sure they are certified and have degrees in their content areas, there still is no set criteria or definition of what makes a teacher effective. As Little and Miller (2007) found, without some kind of unified structure, selecting based on local norms and biases would increase the status quo and do little in the way of increasing student achievement. DiMaggio and Powell (1983) stated institutionalization "makes it difficult for organizations to turn back or go forward, and that instead they stick with the status quo" (p. 358). The key to predictive analysis is that based on the responses from both groups of principals, professional development on the hiring process is needed on the district level, and courses on human capital management are needed in principal certification programs. Principals' failure to use a research-based system to screen and select teachers will continue to make poor, uninformed, and ineffective hires (Walsh & Tracey, 2004). Making the best possible decision with the best information provided reduces the likelihood of making a poor hiring decision. Predictive analysis should be used to identify teacher talent and strategically place that talent in schools that have the most need (Odden, 2011). The Moneyball theory had been around 30 years before the Oakland A's became the first

team to adopt it in 2001; hopefully, this study will be added to the research that will bring about change to the hiring process much sooner.

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Appendix A

Letter to School Participants

John Howard
Department of Professional Growth Systems
45 West Gude Drive, Suite 2400
Rockville, MD 20850

Dear Colleague,

My name is John Howard, and I am a Consulting Teacher for MCPS. I am also a doctoral candidate in the Educational Entrepreneurial Leadership program at Johns Hopkins University. As part of my studies I am conducting research on the screening and selection of teacher candidates by MCPS' high school principals.

The study is targeting the screening and selection processes of teacher candidates in MCPS high schools. The study will provide some participants with an online professional development on the credentials most associated with student achievement, and the decision-making processes for screening and selecting effective teachers. The potential benefits of this study to you would be access to research based data to help you and your administrative team make informed decisions on the most salient criteria for recruiting and hiring the teachers that would positively impact student achievement. This brief online professional development will be conducted during the 2018 hiring season.

Your participation in this study voluntary. Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

As a school leader, I am well aware of how busy you are. For your time in participating in this study you will receive a $10.00 gift card to either *Panera Bread* or *Starbucks*.

All participation is voluntary. To participate, you must first complete the attached consent form. Once the consent form is completed and returned, you will be sent an email with a 10 minute survey to complete. The survey should not take any more than 15 minutes. It will ask questions about your leadership experience and the processes you go through when screening and selecting teacher candidates.

If you have any questions, please do not hesitate to contact me at the number above, or by email at John_E_Howard@mcpsmd.org.

Thank you for your participation

Sincerely yours,
John E. Howard, Jr.

Appendix B

Informed Consent Letter

Johns Hopkins University

Homewood Institutional Review Board Informed Consent Form

Informed Consent Form

Title:	**Educational Moneyball: Principals' Decision-Making Processes in the Screening and Selecting of Effective Teachers**
Principal Investigator:	Dr. Eric Mayes
Date:	June 1, 2018

PURPOSE OF RESEARCH STUDY:

The purpose of this research study is to investigate the teacher candidate screening and selection practices of the 25 high school principals of Montgomery County Public Schools (MCPS). The study is targeting the 11 high-needs high schools as identified by MCPS. The study will provide a brief online professional development for those principals on the credentials most associated with student achievement, and a decision-making process for screening and selecting effective teachers.

The research *design of this study is appropriate for situations in which the researcher cannot randomly place participants in intervention and control groups, instead they are divided systematically on the basis of need, merit, or some other qualifying condition.* The principals of the 11 high needs high schools would serve as the treatment group, while those 14 principals not receiving the treatment will serve as the control/non-treatment group. The program will be conducted during June of 2018.

PROCEDURES:

The expected duration of the study would be four weeks. Participation would require viewing an online professional development presentation, with additional follow-ups through e-mail as reminders of deadlines and to provide clarifications where needed or requested

The control group will complete the pre and post-intervention surveys which should require no more than 10 to 15 minutes of time.

The treatment group will complete pre and post intervention surveys, as well as participate in the online presentation. Due to the asynchronous nature of the presentation, participants will be allowed to work at their own pace with the deadline for completion of the presentation portion by June 22.

RISKS/DISCOMFORTS:

There are no physical risks associated with this study.

BENEFITS:

The potential benefits for participants of this study would be the knowledge gained on teacher credentials related to student achievement, and the potential to make more informed hiring decisions that could benefit their schools.

The benefit to society is the potential for improving of hiring practices of principals of high-poverty high schools, which in turn should have a positive impact on student performance.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your participation in this study is entirely voluntary. You choose whether to participate, and your signature below will indicate whether you agree to take part in the study. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled.

You can stop participation in the study at any time, without any penalty or loss of benefits. If you want to withdraw, please contact John Howard via phone or email: (240) 602-1027, John_E_Howard @mcpsmd.org, or jhowar10@jhu.edu .

CIRCUMSTANCES THAT COULD LEAD US TO END YOUR PARTICIPATION:

Under certain circumstances we may decide to end your participation before you have completed the study. Specifically, we may stop your participation if you are not following directions related to the study, or because the study has been terminated before completion. There may also be other circumstances that would lead us to end your participation.

If we end your participation before you have completed the study, we will provide compensation for your participation up to that time.

CONFIDENTIALITY:

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

All measures will be examined by the Principal Investigator and research affiliates only (including those entities described above). No identifiable information will be included in any reports of the research published or provided to school administration. A participant number will be assigned to all surveys.

Surveys will be collected in either electronic or paper format. Survey data completed electronically will be collected via a password protected Google Docs account that belongs to Johns Hopkins University School of Education. If you are unable to complete the surveys electronically, paper copies will be provided upon request. Hard copies of the research data will be stored and secured in the student investigator's key accessible lockbox. Data stored on a computer will be password protected and backed up on a password protected secure cloud Google Drive. Any electronic files will be erased and paper documents shredded, ten years after collection. Only group data will be included in publication; no individual data will ever be published.

COMPENSATION:

If you satisfactorily complete the study, you will receive a $10.00 gift card to *Starbucks* or *Panera Bread* to compensate you for your participation. Another gift card of this amount would be a bonus for completing all of the online presentation. If you end your participation before completing the study, you will be paid for your participation up to that time.

IF YOU HAVE QUESTIONS OR CONCERNS:

You can ask questions about this research study at any time during the study by contacting John Howard by phone or e-mail at 240-602-1027 John_E_Howard@mcpsmd,org or JHowar10@jhu.edu

If you have questions about your rights as a research participant, or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580.

SIGNATURES

WHAT YOUR SIGNATURE MEANS:

Your signature below means that you understand the information in this consent form. Your signature also means that you agree to participate in the study.

By signing this consent form, you have not waived any legal rights you otherwise would have as a participant in a research study.

Participant's Signature **Date**

Signature of Person Obtaining Consent **Date**
(Investigator or HIRB Approved Designee)

Appendix C

Principal Preintervention Survey

The purpose of this research study is to examine the screening and selection practices of high school principals in Montgomery County Public Schools when hiring teacher candidates.

* Required

Email address *
Your email

Name of School *
Your answer

Please indicate your race/ethnicity. *
African-American/Black
American Indian
Asian
Hispanic/Latino
Two or more races
White

Please indicate your gender *
Female
Male

Years of Teaching Experience *
0-5
6-10
11-15
15-20
More than 20

Years as an Assistant Principal *
0-5
6-10
11-15
15-20
More than 20

Years as a Principal *
0-5
6-10
11-15

15-20
More than 20

What is your highest degree earned? *
Masters
Doctorate

Which best describes the school that you currently lead? *
High Poverty
Low Poverty

In your opinion, what qualities make a teacher effective? *
Your answer

How does your district screen and select potential hires? *
Your answer

What decision-making strategies do you use at your school to screen effective teachers for interviews? *
Your answer

Rate the importance of the quality: YEARS OF EXPERIENCE on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1
2
3
4
5

Most important

Based on Years of Experience, which level of experience matters the most to you when screening and selecting candidates
Experience Does Not Matter

First Year Teacher
1-2 years of Experience
3-5 years of Experience
6-10 years of Experience
11-15 years of Experience
16-20 years of Experience
More than 20 years

Rate the importance of the quality: LEVEL OF DEGREE ATTAINED (Masters or higher) on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1
2
3
4
5

Most important

Rate the importance of the quality: NATIONAL BOARD CERTIFICATION on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1
2
3
4
5

Most important

Rate the importance of the quality: REPUTATION OF UNDERGRADUATE SCHOOL ATTENDED on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1
2
3
4
5

Most important

Rate the importance of the quality: LEVEL OF CERTIFICATION (Standard 1, Standard II, Advanced) on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1

2
3
4
5

Most important

Rate the importance of the quality: REFERENCES/RECOMMENDATIONS on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1
2
3
4
5

Most important

Rate the importance of the quality: PRAXIS II SCORES on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1
2
3
4
5

Most important

Rate the importance of the quality: RACE, GENDER, ETHNICITY on a scale from 1 being not at all important to 5 being most important when screening applicants for a teaching position. *

Not at all important

1
2
3
4
5

Most important

What are some challenges that you face during the process of screening and selecting teacher candidates? *

Your answer

List 3 ways in which high poverty or low performing high schools can attract effective teachers. *

Your answer

What are some strategies that you have used to retain effective teachers? *

Your answer

What are some ways that high schools can attract effective teachers? *

Your answer

Are you familiar with the Administrative Decision-Making Model? *

Yes

No

Do you think principals would benefit from professional development on how to screen and select teacher candidates? *

Yes

No

A copy of your responses will be emailed to the address you provided.

Appendix D

Principal Postintervention Survey

The purpose of this research study is to examine the screening and selection practices of high school principals in Montgomery County Public Schools when hiring teacher candidates.

* Required

Email address *
Your email

Name of School *
Your answer

What position(s) are your highest priority during this hiring season?
Your answer

What decision-making strategies did you use to screen for effective teachers for interviews? *
Your answer

Rate the importance of the quality: YEARS OF EXPERIENCE on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4
5

Extremely important

Based on YEARS OF EXPERIENCE, which level of experience mattered the most to you when screening and selecting these potential candidates *
Experience Did Not Matter
First Year Teacher
1-2 years of Experience
3-5 years of Experience

6-10 years of Experience
11-15 years of Experience
16-20 years of Experience
More than 20 years

Rate the importance of the quality: LEVEL OF DEGREE ATTAINED (Masters or higher) on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4
5

Extremely important

Rate the importance of the quality: NATIONAL BOARD CERTIFICATION on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4
5

Extremely important

Rate the importance of the quality: REPUTATION of UNDERGRADUATE SCHOOL ATTENDED on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4
5

Extremely important

Rate the importance of the quality: LEVEL OF CERTIFICATION (Standard I, Standard II, Advanced) on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4

5

Extremely important

Rate the importance of the quality: REFERENCES/RECOMMENDATIONS on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4
5

Extremely important

Rate the importance of the quality: PRAXIS II SCORES on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4
5

Extremely important

Rate the importance of the quality: RACE, GENDER, ETHNICITY on a scale from 1 being not at all important to 5 being most important when screening applicants for these teaching positions. *

Not at all important

1
2
3
4
5

Extremely important

How can your school more effectively screen and select teacher candidates? *

Your answer

How can your district more effectively screen and select teacher candidates?

Your answer

What were the credentials of the MOST QUALIFIED candidate that you interviewed for a position? *

Your answer

What were the credentials of the LEAST QUALIFIED candidate that you interviewed for a position? *

Your answer

Thank you for participating in this study. If you have any further comments, or wish to expand on previous answers, if you have any questions, or feedback, please provide below.

Your answer

Appendix E

Median Responses and Interquartile Ranges for Postintervention Survey

Credential	Group-demo		Statistic	Std. error
EXP-post	Control	Mean	3.11	.455
		95% confidence interval for mean — Lower bound	2.06	
		95% confidence interval for mean — Upper bound	4.16	
		5% trimmed mean	3.12	
		Median	3.00	
		Variance	1.861	
		Std. deviation	1.364	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	3	
		Skewness	.128	.717
		Kurtosis	-.782	1.400
	Treatment	Mean	2.25	.491
		95% confidence interval for mean — Lower bound	1.09	
		95% confidence interval for mean — Upper bound	3.41	
		5% Trimmed mean	2.22	
		Median	2.00	
		Variance	1.929	
		Std. deviation	1.389	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	3	
		Skewness	.267	.752
		Kurtosis	-2.212	1.481
Level of EXP-post	Control	Mean	2.78	.572
		95% confidence interval for mean — Lower bound	1.46	
		95% confidence interval for mean — Upper bound	4.10	
		5% trimmed mean	2.70	
		Median	3.00	
		Variance	2.944	
		Std. deviation	1.716	
		Minimum	1	
		Maximum	6	
		Range	5	
		Interquartile range	3	
		Skewness	.630	.717
		Kurtosis	-.166	1.400

(continued)

Credential	Group-demo		Statistic	Std. error
Level of EXP-post (cont'd.)	Treatment	Mean	2.75	.726
		95% confidence interval for mean — Lower bound	1.03	
		95% confidence interval for mean — Upper bound	4.47	
		5% trimmed mean	2.67	
		Median	2.00	
		Variance	4.214	
		Std. deviation	2.053	
		Minimum	1	
		Maximum	6	
		Range	5	
		Interquartile range	4	
		Skewness	.578	.752
		Kurtosis	-1.480	1.481
Level of degree-post	Control	Mean	3.33	.408
		95% confidence interval for mean — Lower bound	2.39	
		95% confidence interval for mean — Upper bound	4.27	
		5% trimmed mean	3.37	
		Median	4.00	
		Variance	1.500	
		Std. deviation	1.225	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	2	
		Skewness	-.816	.717
		Kurtosis	.349	1.400
	Treatment	Mean	2.50	.378
		95% confidence interval for mean — Lower bound	1.61	
		95% confidence interval for mean — Upper bound	3.39	
		5% trimmed mean	2.50	
		Median	3.00	
		Variance	1.143	
		Std. deviation	1.069	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	2	
		Skewness	-.468	.752
		Kurtosis	-.831	1.481

(continued)

Credential	Group-demo		Statistic	Std. error
NBCT-post	Control	Mean	2.56	.294
		95% confidence interval for mean — Lower bound	1.88	
		95% confidence interval for mean — Upper bound	3.23	
		5% trimmed mean	2.56	
		Median	3.00	
		Variance	.778	
		Std. deviation	.882	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	1	
		Skewness	-.214	.717
		Kurtosis	.144	1.400
	Treatment	Mean	1.75	.313
		95% confidence interval for mean — Lower bound	1.01	
		95% confidence interval for mean — Upper bound	2.49	
		5% trimmed mean	1.72	
		Median	1.50	
		Variance	.786	
		Std. deviation	.886	
		Minimum	1	
		Maximum	3	
		Range	2	
		Interquartile range	2	
		Skewness	.615	.752
		Kurtosis	-1.481	1.481
Rep of undergrad-post	Control	Mean	2.56	.412
		95% confidence interval for mean — Lower bound	1.61	
		95% confidence interval for mean — Upper bound	3.51	
		5% trimmed mean	2.51	
		Median	3.00	
		Variance	1.528	
		Std. deviation	1.236	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	2	
		Skewness	.603	.717
		Kurtosis	.910	1.400

(continued)

Credential	Group-demo		Statistic	Std. error
Rep of undergrad-post (cont'd.)	Treatment	Mean	1.50	.267
		95% confidence interval for mean — Lower bound	.87	
		95% confidence interval for mean — Upper bound	2.13	
		5% trimmed mean	1.44	
		Median	1.00	
		Variance	.571	
		Std. deviation	.756	
		Minimum	1	
		Maximum	3	
		range	2	
		interquartile range	1	
		Skewness	1.323	.752
		Kurtosis	.875	1.481
Level of cert-post	Control	Mean	3.22	.494
		95% confidence interval for mean — Lower bound	2.08	
		95% confidence interval for mean — Upper bound	4.36	
		5% trimmed mean	3.25	
		Median	4.00	
		Variance	2.194	
		Std. deviation	1.481	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	3	
		Skewness	-.188	.717
		Kurtosis	-1.670	1.400
	Treatment	Mean	2.63	.324
		95% confidence interval for mean — Lower bound	1.86	
		95% confidence interval for mean — Upper bound	3.39	
		5% trimmed mean	2.64	
		Median	3.00	
		Variance	.839	
		Std. deviation	.916	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	1	
		Skewness	-.488	.752
		Kurtosis	.421	1.481

(continued)

Credential	Group-demo		Statistic	Std. error
Recs and refs-post	Control	Mean	4.56	.176
		95% confidence interval for mean — Lower bound	4.15	
		95% confidence interval for mean — Upper bound	4.96	
		5% trimmed mean	4.56	
		Median	5.00	
		Variance	.278	
		Std. deviation	.527	
		Minimum	4	
		Maximum	5	
		Range	1	
		Interquartile range	1	
		Skewness	-.271	.717
		Kurtosis	-2.571	1.400
	Treatment	Mean	4.88	.125
		95% confidence interval for mean — Lower bound	4.58	
		95% confidence interval for mean — Upper bound	5.17	
		5% trimmed mean	4.92	
		Median	5.00	
		Variance	.125	
		Std. deviation	.354	
		Minimum	4	
		Maximum	5	
		Range	1	
		Interquartile range	0	
		Skewness	-2.828	.752
		Kurtosis	8.000	1.481
Praxis score-post	Control	Mean	2.33	.408
		95% confidence interval for mean — Lower bound	1.39	
		95% confidence interval for mean — Upper bound	3.27	
		5% trimmed mean	2.31	
		Median	2.00	
		Variance	1.500	
		Std. deviation	1.225	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	3	
		Skewness	.233	.717
		Kurtosis	-1.556	1.400

(continued)

Credential		Group-demo		Statistic	Std. error
Praxis score-post (cont'd.)	Treatment	Mean		2.38	.375
		95% confidence interval for mean	Lower bound	1.49	
			Upper bound	3.26	
		5% trimmed mean		2.36	
		Median		2.50	
		Variance		1.125	
		Std. deviation		1.061	
		Minimum		1	
		Maximum		4	
		Range		3	
		Interquartile range		2	
		Skewness		-.045	.752
		Kurtosis		-.940	1.481
Race or gender-post	Control	Mean		3.67	.236
		95% confidence interval for mean	Lower bound	3.12	
			Upper bound	4.21	
		5% trimmed mean		3.74	
		Median		4.00	
		Variance		.500	
		Std. deviation		.707	
		Minimum		2	
		Maximum		4	
		Range		2	
		Interquartile range		1	
		Skewness		-2.121	.717
		Kurtosis		4.000	1.400
	Treatment	Mean		3.00	.423
		95% confidence interval for mean	Lower bound	2.00	
			Upper bound	4.00	
		5% trimmed mean		3.00	
		Median		3.00	
		Variance		1.429	
		Std. deviation		1.195	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile range		2	
		Skewness		.000	.752
		Kurtosis		.812	1.481

Appendix F

Medians and Interquartile Ranges for the Preintervention Survey

Credential	Group-demo		Statistic	Std. error
EXP-pre	Control	Mean	2.78	.401
		95% confidence interval for mean — Lower bound	1.85	
		95% confidence interval for mean — Upper bound	3.70	
		5% trimmed mean	2.75	
		Median	3.00	
		Variance	1.444	
		Std. deviation	1.202	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	2	
		Skewness	.537	.717
		Kurtosis	.270	1.400
	Treatment	Mean	2.63	.420
		95% confidence interval for mean — Lower bound	1.63	
		95% confidence interval for mean — Upper bound	3.62	
		5% trimmed mean	2.64	
		Median	3.00	
		Variance	1.411	
		Std. deviation	1.188	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	3	
		Skewness	-.394	.752
		Kurtosis	-1.229	1.481
Level of EXP-pre	Control	Mean	3.00	.527
		95% confidence interval for mean — Lower bound	1.78	
		95% confidence interval for mean — Upper bound	4.22	
		5% trimmed mean	2.94	
		Median	3.00	
		Variance	2.500	
		Std. deviation	1.581	
		Minimum	1	
		Maximum	6	
		Range	5	
		Interquartile range	3	
		Skewness	.488	.717
		Kurtosis	.400	1.400

(continued)

Credential	Group-demo		Statistic	Std. error
Level of EXP-pre (cont'd.)	Treatment	Mean	2.63	.680
		95% confidence interval for mean Lower bound	1.02	
		95% confidence interval for mean Upper bound	4.23	
		5% trimmed mean	2.53	
		Median	2.00	
		Variance	3.696	
		Std. deviation	1.923	
		Minimum	1	
		Maximum	6	
		Range	5	
		Interquartile range	3	
		Skewness	.711	.752
		Kurtosis	-.765	1.481
Level of degree-pre	Control	Mean	2.78	.434
		95% confidence interval for mean Lower bound	1.78	
		95% confidence interval for mean Upper bound	3.78	
		5% trimmed mean	2.75	
		Median	3.00	
		Variance	1.694	
		Std. deviation	1.302	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	2	
		Skewness	.083	.717
		Kurtosis	-.189	1.400
	Treatment	Mean	2.38	.375
		95% confidence interval for mean Lower bound	1.49	
		95% confidence interval for mean Upper bound	3.26	
		5% trimmed mean	2.36	
		Median	2.50	
		Variance	1.125	
		Std. deviation	1.061	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	2	
		Skewness	-.045	.752
		Kurtosis	-.940	1.481

(continued)

Credential	Group-demo		Statistic	Std. error
NBCT-pre	Control	Mean	2.11	.261
	95% confidence interval for mean	Lower bound	1.51	
		Upper bound	2.71	
	5% trimmed mean		2.12	
	Median		2.00	
	Variance		.611	
	Std. deviation		.782	
	Minimum		1	
	Maximum		3	
	Range		2	
	Interquartile range		2	
	Skewness		-.216	.717
	Kurtosis		-1.041	1.400
	Treatment	Mean	1.63	.263
	95% confidence interval for mean	Lower bound	1.00	
		Upper bound	2.25	
	5% trimmed mean		1.58	
	Median		1.50	
	Variance		.554	
	Std. deviation		.744	
	Minimum		1	
	Maximum		3	
	Range		2	
	Interquartile range		1	
	Skewness		.824	.752
	Kurtosis		-.152	1.481
Rep of undergrad-pre	Control	Mean	2.67	.471
	95% confidence interval for mean	Lower bound	1.58	
		Upper bound	3.75	
	5% trimmed mean		2.63	
	Median		2.00	
	Variance		2.000	
	Std. deviation		1.414	
	Minimum		1	
	Maximum		5	
	Range		4	
	Interquartile range		3	
	Skewness		.417	.717
	Kurtosis		-1.089	1.400

(continued)

Credential	Group-demo		Statistic	Std. error
Rep of undergrad-pre (cont'd.)	Treatment	Mean	1.75	.250
		95% confidence interval for mean Lower bound	1.16	
		95% confidence interval for mean Upper bound	2.34	
		5% trimmed mean	1.72	
		Median	2.00	
		Variance	.500	
		Std. deviation	.707	
		Minimum	1	
		Maximum	3	
		Range	2	
		Interquartile range	1	
		Skewness	.404	.752
		Kurtosis	-.229	1.481
Level of cert-pre	Control	Mean	2.67	.441
		95% confidence interval for mean Lower bound	1.65	
		95% confidence interval for mean Upper bound	3.68	
		5% trimmed mean	2.63	
		Median	3.00	
		Variance	1.750	
		Std. deviation	1.323	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	2	
		Skewness	.370	.717
		Kurtosis	-.315	1.400
	Treatment	Mean	2.88	.479
		95% confidence interval for mean Lower bound	1.74	
		95% confidence interval for mean Upper bound	4.01	
		5% trimmed mean	2.86	
		Median	2.50	
		Variance	1.839	
		Std. deviation	1.356	
		Minimum	1	
		Maximum	5	
		Range	4	
		Interquartile range	2	
		Skewness	.294	.752
		Kurtosis	-1.078	1.481

(continued)

Credential	Group-demo		Statistic	Std. error
Recs and refs-pre	Control	Mean	4.67	.167
		95% confidence interval for mean — Lower bound	4.28	
		95% confidence interval for mean — Upper bound	5.05	
		5% trimmed mean	4.69	
		Median	5.00	
		Variance	.250	
		Std. deviation	.500	
		Minimum	4	
		Maximum	5	
		Range	1	
		Interquartile range	1	
		Skewness	-.857	.717
		Kurtosis	-1.714	1.400
	Treatment	Mean	4.75	.164
		95% confidence interval for mean — Lower bound	4.36	
		95% confidence interval for mean — Upper bound	5.14	
		5% trimmed mean	4.78	
		Median	5.00	
		Variance	.214	
		Std. deviation	.463	
		Minimum	4	
		Maximum	5	
		Range	1	
		Interquartile range	1	
		Skewness	-1.440	.752
		Kurtosis	.000	1.481
Praxis score-pre	Control	Mean	2.44	.412
		95% confidence interval for mean — Lower bound	1.49	
		95% confidence interval for mean — Upper bound	3.39	
		5% trimmed mean	2.44	
		Median	3.00	
		Variance	1.528	
		Std. deviation	1.236	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	3	
		Skewness	-.092	.717
		Kurtosis	-1.692	1.400

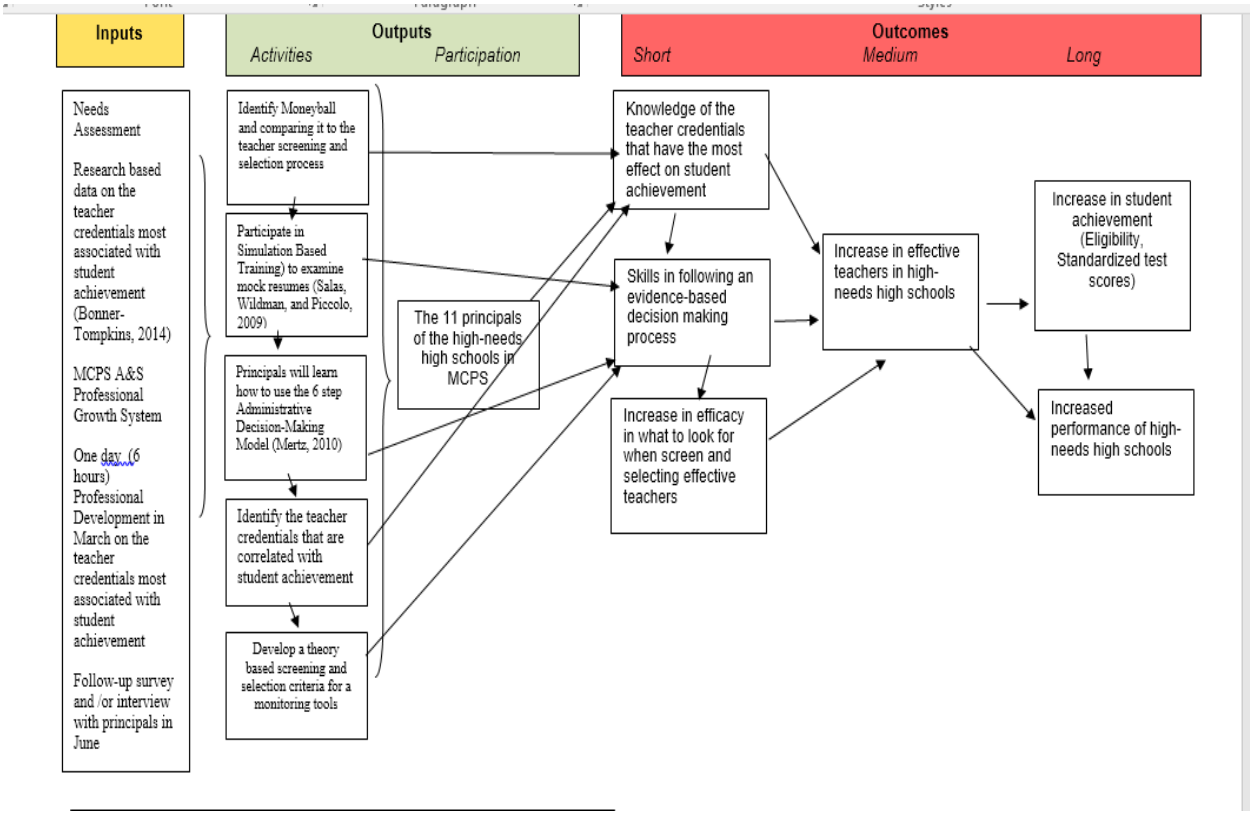
(continued)

Credential	Group-demo		Statistic	Std. error
Praxis score-pre (cont'd.)	Treatment	Mean	2.00	.500
		95% confidence interval for mean — Lower bound	.82	
		95% confidence interval for mean — Upper bound	3.18	
		5% trimmed mean	1.94	
		Median	1.00	
		Variance	2.000	
		Std. deviation	1.414	
		Minimum	1	
		Maximum	4	
		Range	3	
		Interquartile range	3	
		Skewness	.808	.752
		Kurtosis	-1.643	1.481
Race or gender-pre	Control	Mean	3.22	.278
		95% confidence interval for mean — Lower bound	2.58	
		95% confidence interval for mean — Upper bound	3.86	
		5% trimmed mean	3.25	
		Median	3.00	
		Variance	.694	
		Std. deviation	.833	
		Minimum	2	
		Maximum	4	
		Range	2	
		Interquartile range	2	
		Skewness	-.501	.717
		Kurtosis	-1.275	1.400
	Treatment	Mean	2.75	.250
		95% confidence interval for mean — Lower bound	2.16	
		95% confidence interval for mean — Upper bound	3.34	
		5% trimmed mean	2.83	
		Median	3.00	
		Variance	.500	
		Std. deviation	.707	
		Minimum	1	
		Maximum	3	
		Range	2	
		Interquartile range	0	
		Skewness	-2.828	.752
		Kurtosis	8.000	1.481

Appendix G

Logic Model

Program: Educational Moneyball: Using Predictive Analytics to Screen and Select Effective Teachers for High-poverty High Schools (Rev 4/16)
Problem: Principals of high-poverty high schools have problems hiring effective teachers for their schools. When screening and selecting teacher candidates school leaders do not know the teacher credentials that are associated with student achievement.



Assumptions

- Principals believe that some teacher credentials are more important than others
- Principals of high-poverty high schools believe the most "effective" teachers teach at high performing schools.
- Effective teachers lead to student achievement
- Better decision-making will lead to improved screening and selection of teacher candidates

External Factors

- Achievement Gap in the district between the high-poverty and low-poverty schools (Bonner-Tompkins, 2014)

- Teacher unions may have issue with the downplaying of years of experience and advanced degrees
- District initiative on hiring effective and diverse teachers.

Appendix H

Research Questions, Data Measures, Data Type, Collection Timeline, and Analysis

Research Question	Data Measure	Data Type	Collection Timeline	Analysis
What criteria do principals use to make their decisions on screening and selecting effective teachers?	Preintervention Survey based on Papa and Baxter (2008)	Online Google Form	June 1-8: Consent Letter & Survey 1	Independent-Samples Mann-Whitney *U* test
What skills do principals need in order to make more informed decisions in the teacher candidates they screen and select?	Postintervention Survey based on Papa and Baxter (2008)	Online Google Form	June 22-Auguist 3: Final survey.	Independent-Samples Mann-Whitney *U* test

Vita

John Howard received his bachelor's degree in English/Media Journalism from North Carolina Central University in 1994. He then received a Master's degree in English Literature from Bowie State University 2011. John then received his Doctorate in Education with a specialization in Entrepreneurial Leadership from Johns Hopkins University in 2017. John is a consulting teacher presently employed with Montgomery County Public Schools in Maryland